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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

JULY 2000

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CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25	

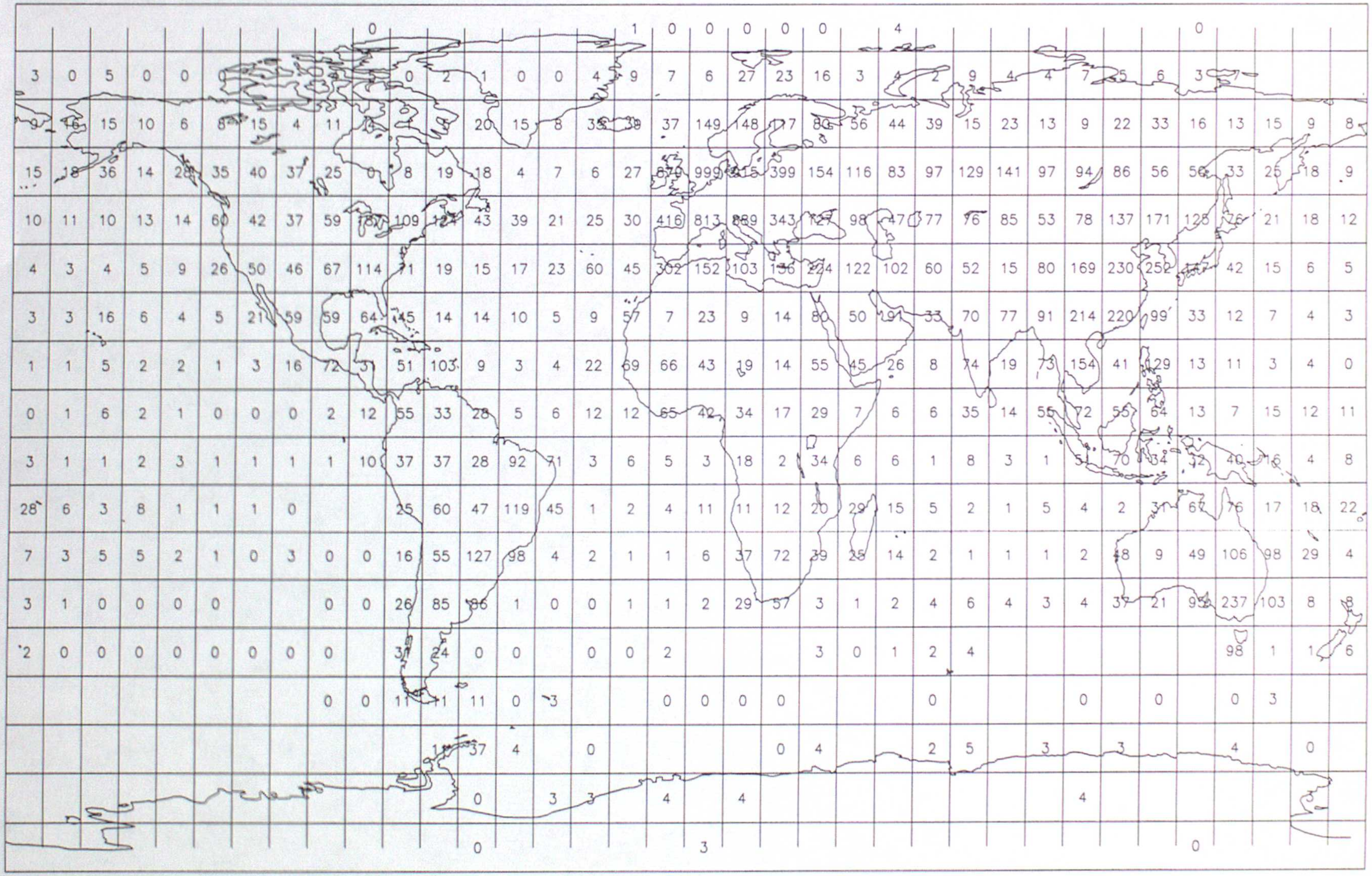
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CTFS	ALL	P	SUR	31	0	0	2.0	-4.3	4.7
DGAF	ALL	P	SUR	45	1	2	2.3	-5.3	5.8
DGSR	ALL	P	SUR	32	0	0	1.6	-4.1	4.4
DGTB	ALL	P	SUR	34	0	0	1.4	-4.8	5.0
DVRVW6D	ALL	P	SUR	46	0	0	1.2	5.6	5.7
DZSE	ALL	P	SUR	27	7	26	6.4	-3.3	7.2
ELED8	ALL	P	SUR	22	0	0	0.6	-6.8	6.8
ELMQ	ALL	P	SUR	25	0	0	1.5	-5.2	5.4
ELVJ9	ALL	P	SUR	43	0	0	1.4	-4.3	4.5
MXAR9	ALL	P	SUR	35	0	0	1.2	4.2	4.4
PDAH	ALL	P	SUR	74	0	0	1.0	-6.2	6.3
P3YS5	ALL	P	SUR	95	0	0	1.4	5.0	5.2
SYMK	ALL	P	SUR	36	0	0	1.9	5.1	5.5
UAIS	ALL	P	SUR	43	1	2	3.1	-5.9	6.7
UANA	ALL	P	SUR	30	0	0	2.4	-4.6	5.2
UBCB	ALL	P	SUR	29	0	0	2.0	6.2	6.5
UFXA	ALL	P	SUR	47	0	0	1.6	6.4	6.6
UGSI	ALL	P	SUR	62	0	0	1.0	4.5	4.6
VCJM	ALL	P	SUR	31	30	97	0.0	-0.1	0.1
VC6750	ALL	P	SUR	20	0	0	3.8	-4.6	6.0
VDFP	ALL	P	SUR	25	25	100			
VGFQ	ALL	P	SUR	29	29	100			
WAUU	ALL	P	SUR	26	0	0	0.5	4.5	4.5
WCX8812	ALL	P	SUR	35	0	0	1.2	4.0	4.2
WCY3172	ALL	P	SUR	25	0	0	1.5	4.3	4.5
WCZ5535	ALL	P	SUR	35	0	0	1.4	-5.3	5.4
52083	ALL	P	SUR	134	3	2	6.0	0.3	6.0
9MBX5	ALL	P	SUR	34	0	0	2.2	10.2	10.4
9VIH	ALL	P	SUR	57	14	25	5.0	-1.6	5.2
9VOG	ALL	P	SUR	21	0	0	2.1	4.2	4.8
WIND SPEED									
A3CW5	ALL	SPEED	SUR	23	0	0	3.9	-6.4	7.6
C6JD7	ALL	SPEED	SUR	21	0	0	6.2	15.1	16.3
C6QF4	ALL	SPEED	SUR	21	0	0	4.6	5.1	6.9
DADD	ALL	SPEED	SUR	26	0	0	3.7	5.5	6.6
DGCDFD	ALL	SPEED	SUR	58	0	0	5.4	11.1	12.3
DHEE	ALL	SPEED	SUR	27	0	0	4.9	5.3	7.2
ELVO5	ALL	SPEED	SUR	24	0	0	4.8	8.2	9.5
ELWC6	ALL	SPEED	SUR	31	0	0	5.0	7.6	9.1
MWQD5	ALL	SPEED	SUR	46	0	0	5.4	5.6	7.8
MZNM7	ALL	SPEED	SUR	27	0	0	4.4	6.8	8.1
OYVQ2	ALL	SPEED	SUR	46	0	0	5.7	10.3	11.8
P3AG4	ALL	SPEED	SUR	22	0	0	2.8	5.4	6.1
SWSK	ALL	SPEED	SUR	23	0	0	3.7	6.8	7.7
SXYY	ALL	SPEED	SUR	20	0	0	6.1	6.1	8.7
UCTA	ALL	SPEED	SUR	56	0	0	2.8	5.8	6.4
UIKI	ALL	SPEED	SUR	23	0	0	5.7	5.9	8.2
VRUH8	ALL	SPEED	SUR	39	0	0	9.0	12.9	15.7
VRUN4	ALL	SPEED	SUR	56	0	0	3.3	5.1	6.1
V2PB1	ALL	SPEED	SUR	51	0	0	4.3	8.1	9.2
3ECQ9	ALL	SPEED	SUR	31	0	0	6.5	10.8	12.6
63113	ALL	SPEED	SUR	578	0	0	4.6	-6.2	7.7
9MBQ	ALL	SPEED	SUR	27	0	0	6.4	9.9	11.8
WIND DIRECTION									
UFNH	ALL	DIRN.	SUR	37	0	0	84.1	3.6	84.2
62131	ALL	DIRN.	SUR	22	0	0	9.8	37.7	38.9

AVAILABILITY – SHIP/SYNOP – JULY 2000

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20396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15 18 36 14 28 35 40 37 25 0 8 19 18 4 7 6 27 670 999 815 399 154 116 83 97 129 141 97 94 86 56 56 33 25 18 9
10 11 10 13 14 60 42 37 59 187 109 124 43 39 21 25 30 416 813 889 343 127 98 47 77 76 85 53 78 137 171 125 76 21 18 12
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28 6 3 8 1 1 1 0 25 60 47 119 45 1 2 4 11 11 12 20 29 15 5 2 1 5 4 2 37 67 76 17 18 22
7 3 5 5 2 1 0 3 0 0 16 55 127 98 4 2 1 1 6 37 72 39 25 14 2 1 1 1 2 48 9 49 106 98 29 4
3 1 0 0 0 0 0 0 26 85 86 1 0 0 1 1 2 29 57 3 1 2 4 6 4 3 4 37 21 95 237 103 8 8
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0 0 11 11 11 0 3 0 0 0 0 0 0 0 0 3
1 37 4 0 0 4 2 5 3 3 4 0
0 3 3 4 4 4
0 3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

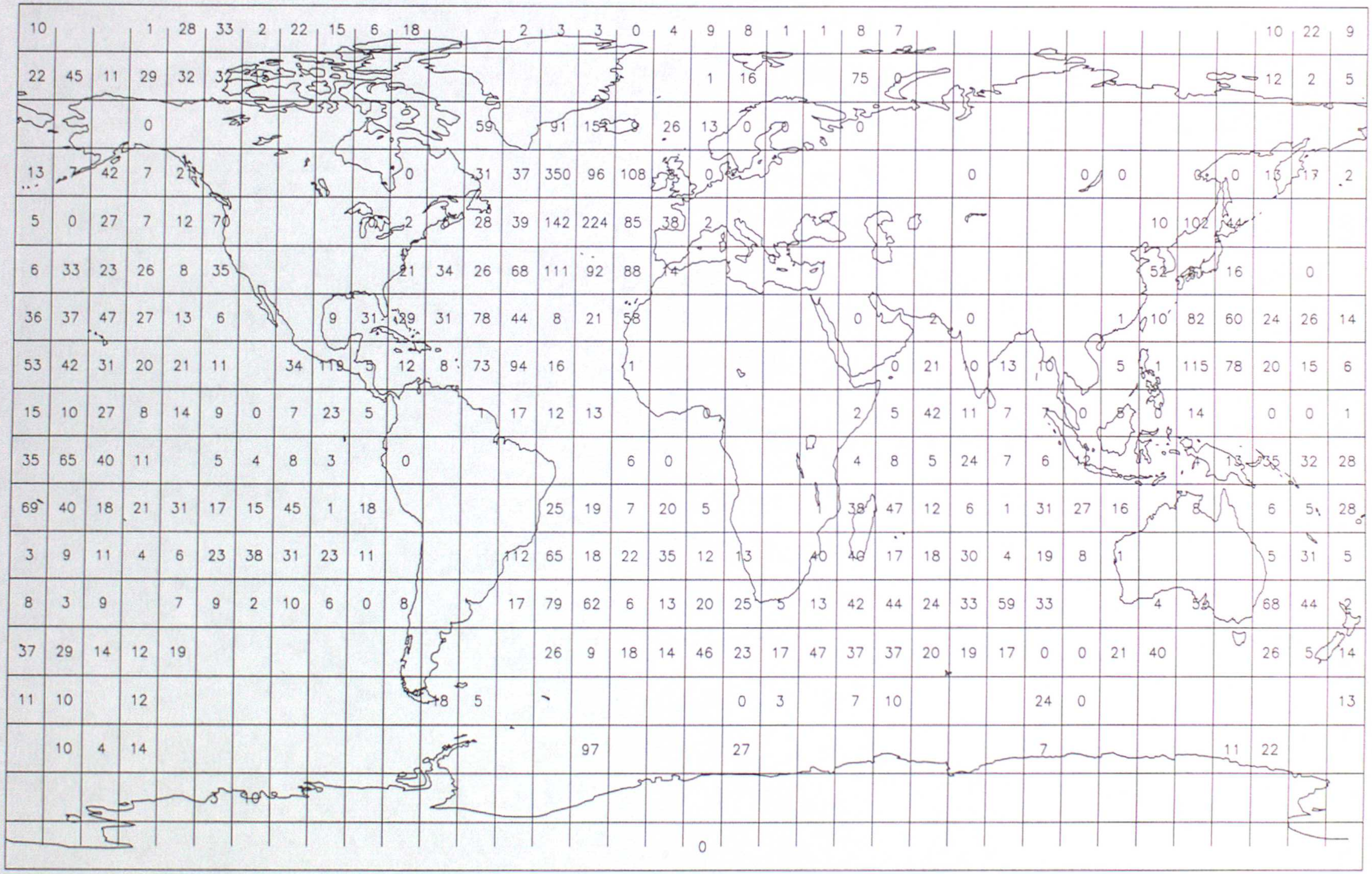
1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
14913	-40.1	50.7	ALL	P	SUR	20	8	40	1.2	-0.7	1.4
17539	-30.2	-4.9	ALL	P	SUR	203	61	30	1.1	0.2	1.1
21909	42.9	141.0	ALL	P	SUR	306	6	2	4.4	4.1	6.0
23517	22.9	64.5	ALL	P	SUR	61	1	2	2.4	4.5	5.1
31949	-33.8	-34.7	ALL	P	SUR	1185	57	5	4.9	4.8	6.9
31960	-30.2	-28.5	ALL	P	SUR	159	159	100			
32639	-28.9	-87.9	ALL	P	SUR	20	19	95	0.0	-14.4	14.4
33543	-33.4	9.3	ALL	P	SUR	22	15	68	0.7	10.6	10.6
33903	-37.9	-5.1	ALL	P	SUR	229	113	49	6.2	5.6	8.4
33904	-41.8	4.6	ALL	P	SUR	174	2	1	3.5	5.4	6.4
41651	31.4	-67.9	ALL	P	SUR	57	0	0	0.8	4.2	4.3
46561	27.2	-172.1	ALL	P	SUR	208	0	0	0.7	-5.0	5.0
46927	30.0	-165.2	ALL	P	SUR	341	165	48	0.5	0.0	0.5
53510	-27.0	39.6	ALL	P	SUR	263	52	20	6.6	3.3	7.4
WIND SPEED											
43527	7.0	-68.0	ALL	SPEED	SUR	60	0	0	1.6	6.4	6.6
43528	14.5	-78.4	ALL	SPEED	SUR	326	0	0	1.4	7.9	8.0
44724	42.6	-34.6	ALL	SPEED	SUR	300	0	0	7.0	9.5	11.8
52643	23.9	163.7	ALL	SPEED	SUR	30	0	0	9.2	5.2	10.6
WIND DIRECTION											
46701	50.0	-140.6	ALL	DIRN.	SUR	297	0	0	32.6	-30.0	44.2

AVAILABILITY – DRIFTER – JULY 2000
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 8091

FIGURE 2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36 37 47 27 13 6 9 31 29 31 78 44 8 21 58 0 2 0 1 10 82 60 24 26 14
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35 65 40 11 5 4 8 3 0 6 0 4 8 5 24 7 6 12 4 13 35 32 28
69 40 18 21 31 17 15 45 1 18 25 19 7 20 5 1 38 47 12 6 1 31 27 16 8 6 5 28
3 9 11 4 6 23 38 31 23 11 112 65 18 22 35 12 13 40 40 17 18 30 4 19 8 1 5 31 5
8 3 9 7 9 2 10 6 0 8 17 79 62 6 13 20 25 5 13 42 44 24 33 59 33 4 58 68 44 2
37 29 14 12 19 26 9 18 14 46 23 17 47 37 37 20 19 17 0 0 21 40 26 5 14
11 10 12 18 5 0 3 7 10 24 0 13
10 4 14 97 27 7 11 22
5 10
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	70	0	0	49	1.8	-5.5	5.8
60468	35.6N	6.2E	1052	S8	106	36	34	0	0.9	-0.7	1.1
60511	35.3N	1.4E	1127	S8	106	55	52	0	0.4	14.4	14.4
63602	3.1N	30.9E	1204	S	36	35	97	0	0.0	1.3	1.3
63680	0.3N	32.6E	1144	S	21	0	0	0	0.7	-9.1	9.1
68030	18.5S	25.6E	1071	8	20	0	0	0	0.7	4.5	4.6
68106	23.6S	15.1E	407	S	57	29	51	0	3.4	0.4	3.4
68338	26.9S	24.6E	1234	S8	43	35	81	0	1.0	-0.3	1.0
68396	26.5S	31.3E	641	S8	46	0	0	0	0.7	4.2	4.3

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	114	58	51	0	1.4	0.3	1.4
30967	49.9N	115.8E	623	MS	88	0	0	18	1.7	-4.0	4.3
40726	36.8N	45.7E	1384	MS	87	1	1	60	1.0	4.0	4.1
40738	36.8N	54.5E	155	MS	86	30	35	0	2.8	1.6	3.2
40741	36.6N	61.2E	235	MS	82	0	0	1	2.2	-4.3	4.8
40762	35.3N	59.2E	1333	MS	99	0	0	0	5.6	-4.5	7.2
40836	30.8N	51.7E	1880	MS	81	1	1	10	2.5	4.1	4.8
41254	23.1N	57.7E	1755	S8	81	81	100	0			
41396	16.0N	48.9E	700	MS	42	0	0	0	1.1	5.6	5.7
41466	13.7N	44.1E	1402	8	30	0	0	0	1.1	-6.5	6.6
41696	29.0N	66.6E	2015	S	24	12	50	0	0.8	-1.3	1.5
44416	28.6N	81.6E	720	MS	43	1	2	0	1.2	4.4	4.6
47022	40.8N	128.2E	1200	S	47	0	0	0	0.8	4.5	4.6
51495	43.5N	91.6E	874	M	118	0	0	0	1.2	7.1	7.2
52602	38.8N	93.4E	2734	S	119	0	0	0	1.3	-5.5	5.7
52955	35.6N	100.8E	3201	S	119	0	0	0	0.9	12.7	12.7
53588	39.0N	113.5E	2898	S	119	38	32	0	1.1	1.2	1.6
56146	31.6N	100.0E	339	S	119	119	100	0			
56444	28.5N	98.9E	3488	S	117	54	46	39	0.6	13.4	13.4
56462	29.0N	101.5E	2994	S	118	0	0	0	1.3	9.0	9.1
57816	26.6N	106.7E	1074	MS	118	4	3	0	6.5	-3.9	7.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	45	0	0	0	1.1	-6.6	6.7
82326	3.8S	62.1W	48	MS	87	0	0	0	1.2	4.4	4.6
82927	9.9S	58.3W	250	MS	41	1	2	61	1.8	-11.1	11.2
83214	10.3S	54.9W	285	MS	72	3	4	4	1.1	-7.6	7.7
83235	12.4S	46.4W	604	MS	86	0	0	0	0.8	6.6	6.6
83332	14.1S	46.4W	826	MS	86	13	15	1	1.1	13.6	13.6
83376	15.9S	49.0W	740	MS	87	0	0	0	0.6	-4.0	4.0
83408	14.3S	43.8W	447	MS	75	0	0	0	0.8	10.2	10.2
83488	17.8S	42.9W	1097	MS	83	83	100	0			
83531	18.6S	46.5W	940	MS	84	0	0	0	0.7	-7.5	7.5
83587	19.9S	43.9W	850	MS	83	0	0	1	0.9	-7.0	7.1
83704	22.3S	53.9W	369	MS	85	0	0	0	0.9	-9.7	9.7
83773	23.1S	48.9W	793	MS	83	0	0	0	0.8	-10.4	10.4
83836	25.5S	50.6W	837	MS	87	0	0	0	0.7	-5.1	5.1
83953	30.9S	55.5W	231	MS	87	3	3	5	1.1	-11.5	11.6
84377	3.8S	73.3W	125	MS	93	0	0	0	1.1	4.4	4.5
84401	5.2S	80.6W	49	MS	90	0	0	1	1.2	4.3	4.5
84425	5.9S	76.1W	179	MS	52	0	0	2	2.7	4.4	5.2
84455	6.5S	76.4W	281	MS	67	2	3	0	1.0	5.0	5.1
84472	7.1S	78.5W	2620	S	39	0	0	3	0.9	-6.0	6.1

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84474	7.2S	76.7W	350	S	53	2	4	2	1.1	9.3	9.4
84542	9.4S	77.6W	2750	S	22	0	0	23	1.5	4.7	4.9
84686	13.6S	72.0W	3248	S	92	0	0	0	0.9	-4.7	4.8
84688	13.7S	73.4W	3444	S	28	2	7	0	2.6	-11.1	11.4
84720	14.9S	75.0W	567	MS	52	0	0	2	1.6	4.6	4.9
84782	18.1S	70.3W	468	MS	70	0	0	0	1.3	8.1	8.2
85141	14.5S	67.6W	204	MS	58	1	2	2	1.4	4.2	4.4
85264	18.5S	64.1W	1998	S	54	54	100	0			
85312	19.8S	63.9W	992	S	47	0	0	0	1.3	-8.9	9.0
85406	18.3S	70.3W	55	M	114	0	0	1	1.3	5.3	5.5
85432	22.5S	68.9W	2320	S8	77	0	0	0	0.9	5.5	5.6
85836	43.6S	71.8W	277	M	38	0	0	0	2.2	4.7	5.2

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70194	66.6N	145.3W	431	S	106	106	100	0			
71506	66.9N	136.3W	600	MS	117	106	91	0	0.4	-14.4	14.4
72340	34.8N	92.3W	165	MS	119	0	0	22	4.6	4.1	6.2
72376	36.8N	108.2W	1677	M	118	0	0	67	1.3	5.9	6.0
76118	30.4N	109.7W	1040	MS	36	0	0	0	1.0	-10.0	10.0
76658	19.2N	103.7W	494	MS	36	0	0	0	0.9	6.7	6.8
76773	17.8N	97.8W	1680	MS	35	2	6	9	2.0	6.3	6.6
76845	16.7N	92.6W	2276	MS	98	30	31	0	0.7	1.9	2.0

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	326	326	100	0			
91764	14.3S	170.8W	122	M	122	0	0	23	2.4	-12.9	13.1
91848	21.9S	158.0W	41	M	70	1	1	56	4.6	-4.7	6.6
92010	6.1S	145.4E	1587	M	40	0	0	0	0.7	9.9	9.9
92068	10.0S	149.4E	1005	MS	54	2	4	35	0.9	-4.7	4.8
94868	37.8S	145.0E	35	MS	119	0	0	54	0.7	10.7	10.7
97378	10.7S	123.1E	1	MS	43	42	98	0	0.0	-14.2	14.2

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.8N	9.7E	671	MS	87	1	1	0	0.8	7.8	7.8
04416	72.6N	38.4W	3202	S	83	3	4	2	1.0	-4.0	4.1
08568	40.4N	7.6W	1380	S8	350	82	23	8	7.4	-2.0	7.7
10557	50.5N	11.1E	845	S8	356	356	100	0			
12140	54.4N	18.7E	2	MS	117	0	0	0	0.6	7.7	7.7
13269	44.3N	19.9E	176	MS	117	0	0	0	1.0	7.1	7.2
14554	44.9N	18.4E	140	S	59	1	2	0	0.9	-13.3	13.3
14650	43.8N	18.0E	972	S	58	19	33	76	0.8	-13.8	13.8
16470	36.8N	12.0E	191	MS	81	0	0	0	0.7	-4.1	4.2
17042	41.4N	41.4E	33	M	102	0	0	0	1.3	4.2	4.4
17092	39.8N	39.5E	1218	S8	116	0	0	0	1.5	6.2	6.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89208	90.0S	0.0W	2835	S	28	11	39	0	0.5	1.4	1.5
89264	71.4S	68.9W	780	S	237	0	0	0	2.2	8.0	8.3
89266	72.2S	60.3W	91	S	236	142	60	0	7.1	-8.3	10.9
89272	75.0S	70.8W	1395	S	219	217	99	0	1.9	-11.0	11.2
89327	73.2S	127.1W	30	S	236	75	32	0	3.5	-1.3	3.7
89612	66.3S	110.8E	390	S	23	10	43	0	3.7	-2.6	4.5
89661	73.1S	169.6E	200	S	66	1	2	17	3.2	6.8	7.5
89666	76.7S	163.0E	200	S	62	62	100	97			
89744	74.0S	43.0E	3353	S	259	0	0	0	0.9	7.7	7.8
89769	78.5S	168.4E	50	S	382	380	99	0	0.1	-14.7	14.7
89847	67.6S	146.0E	30	S	302	14	5	2	2.0	-10.3	10.5

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	43	0	51	1.9	0.8	43	0	51	0	5.4	0.5
AAH	891	0	37	1.2	0.4	883	0	37	0	5.4	0.8
AAL	7080	0	18	1.3	0.1	7051	0	18	0	6.8	0.7
AAR	1859	0	7	1.7	-0.5	1817	0	8	0	7.3	0.7
ACA	2410	0	3	1.7	0.0	2425	0	3	0	6.4	0.7
ACI	71	3	45	1.2	0.3	73	0	44	0	8.3	1.5
AEA	758	0	3	1.7	0.4	753	0	5	0	7.8	1.3
AEL	475	0	9	1.5	-0.2	467	0	9	0	5.9	0.5
AEY	108	1	4	2.0	0.8	108	0	3	0	8.9	1.3
AFL	576	1	4	1.9	0.4	574	0	3	0	7.2	0.9
AFR	1949	1	6	1.6	0.0	1994	0	6	0	7.1	1.0
AFX	24	0	17	2.2	-0.3	23	4	26	0	10.9	2.9
AIH	253	1	5	1.4	-0.1	258	0	5	0	7.3	0.9
AJM	261	2	2	1.3	-0.2	255	0	2	0	6.2	1.0
AMM	105	0	4	1.5	0.5	110	0	5	0	6.3	0.3
AMT	1418	1	41	2.0	1.3	1401	0	42	0	6.1	0.5
AMX	293	2	5	1.9	0.4	292	0	3	0	9.0	0.9
ANA	1839	1	9	1.5	0.3	1819	0	10	0	7.1	1.0
ANO	33	0	12	1.0	0.1	33	0	12	0	8.2	4.5
ANZ	6363	0	35	1.5	0.1	6316	0	35	0	6.6	0.9
AOM	1134	1	9	1.7	0.8	1143	0	10	0	7.1	0.9
ARG	77	4	25	2.4	0.7	79	0	22	0	8.5	0.0
ASY	26	8	31	1.3	0.2	26	0	27	0	5.3	0.0
AVA	590	1	3	1.6	0.5	589	0	3	0	7.3	0.6
AVN	147	0	50	1.5	-0.2	151	0	51	0	9.1	0.5
AXF	88	0	38	1.4	-0.3	87	0	38	0	7.2	1.7
AZA	729	0	3	2.0	0.4	744	0	5	0	8.5	0.7
BAF	24	0	0	1.2	-0.7	25	0	0	0	4.8	1.2
BAL	201	0	4	1.2	-0.5	195	0	6	0	5.7	1.0
BAW	1580	1	6	1.8	0.2	1567	0	6	0	6.9	0.9
BBB	34	0	9	1.8	-0.4	34	0	9	0	7.8	0.5
BLC	37	11	51	2.6	0.6	39	0	41	0	10.8	2.3
BLX	31	0	0	1.3	-0.9	34	0	3	0	8.4	0.9
BWA	331	1	6	1.9	1.4	328	0	6	0	7.7	1.6
CAL	360	1	6	1.6	0.3	367	0	7	0	6.7	1.1
CCA	403	0	100	2.1	0.3	433	0	100	0	10.3	0.0
CDN	2560	0	10	1.6	0.0	2514	0	11	0	6.6	0.5
CES	408	0	7	1.7	0.3	425	0	100	0	8.4	0.8
CFC	24	4	8	2.0	0.3	22	0	14	0	11.5	3.3
CFG	974	0	3	1.5	-0.8	957	0	3	0	7.0	1.1
CLX	452	0	10	1.7	-0.2	453	0	10	0	7.3	0.8
CMI	236	0	3	1.8	0.6	225	0	2	0	8.5	1.3
CMM	690	0	5	1.6	0.2	682	0	5	0	5.1	0.8
COA	1375	1	28	1.2	0.0	1375	0	29	0	8.5	0.9
CPA	42	0	17	1.6	1.1	43	0	16	0	8.0	3.2
CRL	991	1	8	1.7	0.9	983	0	8	0	6.9	0.9
CSN	104	2	14	2.3	0.1	103	1	14	0	6.3	0.3
CTB	227	0	4	1.6	0.1	227	0	4	0	5.5	1.1
CUB	298	1	6	2.4	1.6	299	0	4	0	7.8	1.2
DAF	24	0	0	2.4	0.3	24	0	0	0	6.9	1.2
DAL	4172	0	31	1.4	0.2	4221	0	31	0	6.5	0.6
DBY	677	1	2	1.3	-0.5	682	0	3	0	7.3	0.8
DCS	66	2	6	2.0	-0.1	67	0	4	0	8.0	-0.1
DLH	2030	0	5	1.7	0.0	2030	0	5	0	6.9	0.8
EEZ	129	3	100	1.9	0.6	128	0	3	0	6.7	0.6
EIA	310	0	40	1.6	0.4	302	1	41	0	7.8	0.9
EIN	46	4	7	0.9	0.3	46	0	4	0	7.7	1.5
ELY	227	0	2	1.2	0.1	233	0	4	0	6.3	0.9
ETH	45	2	18	1.7	-0.4	44	0	18	0	13.1	-0.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EVA	1098	1	3	1.4	-0.3	1095	0	4	0	7.1	0.3
EWW	104	0	8	1.0	0.1	104	0	11	0	8.8	2.3
FDX	1605	0	16	1.4	0.4	1618	0	17	0	6.8	1.0
FIN	459	0	5	1.5	0.3	445	0	7	0	8.4	1.5
FJI	722	2	48	1.6	0.1	711	0	48	0	9.7	0.2
FOM	632	0	31	1.7	0.2	622	0	30	0	7.2	0.7
FWQ	34	0	50	1.1	0.5	36	8	53	0	6.5	2.0
GAF	121	0	0	1.5	0.1	120	0	3	0	8.1	0.8
GCO	87	3	8	1.4	0.6	91	0	100	0	14.9	1.6
GFA	23	0	0	1.2	0.8	23	0	0	0	5.8	1.2
GHA	134	1	2	1.6	0.0	133	0	3	0	10.0	3.4
GRL	70	1	3	1.4	0.1	72	0	6	0	7.9	0.8
GTI	365	0	5	1.5	-0.1	373	0	7	0	8.0	0.2
HAL	4401	0	37	1.3	0.3	4325	0	37	0	8.0	1.2
HLF	105	1	8	1.7	-0.8	103	0	4	0	4.8	1.1
HRH	253	1	65	1.2	-0.2	256	1	66	0	7.2	2.5
IBE	2937	1	6	1.7	0.7	2885	0	7	0	7.3	0.9
ICE	1115	0	2	1.5	0.2	1107	1	4	0	7.8	1.1
ILU	23	4	9	2.4	1.0	23	0	0	0	5.4	0.1
IWD	244	0	1	1.1	-0.6	242	0	2	0	7.6	1.5
JAA	63	3	6	1.9	1.6	56	0	2	0	5.4	0.9
JAL	7109	0	4	1.5	0.1	7009	0	5	0	7.2	0.9
JAZ	751	0	3	1.8	1.5	723	0	4	0	7.1	1.2
JKK	294	1	5	1.2	0.0	275	0	8	0	8.9	0.6
JMC	275	1	7	1.8	1.1	254	0	9	0	8.5	1.3
KAL	4114	1	8	1.5	-0.1	4059	0	9	0	7.8	0.8
KLM	2794	0	13	1.5	0.3	2812	0	14	0	6.8	0.9
LAN	83	8	20	2.0	0.6	86	0	17	0	11.6	0.8
LAP	57	2	28	1.9	0.7	57	4	32	0	11.1	0.8
LDA	105	0	3	1.4	-0.4	107	0	5	0	8.2	1.6
LDI	580	0	100	1.8	-0.9	581	0	6	0	7.0	0.6
LIB	426	1	3	1.6	0.8	430	0	4	0	8.0	1.3
LOT	309	0	3	1.7	-0.9	309	0	5	0	7.6	0.6
LPR	22	0	9	2.2	0.5	22	0	14	0	10.2	-1.0
LTU	839	1	11	2.7	0.4	837	0	6	0	8.0	1.0
LXJ	23	0	26	1.4	-0.2	24	0	29	0	5.1	0.8
MAS	603	0	5	1.6	0.3	602	0	7	0	6.9	0.5
MMZ	73	1	4	1.9	1.1	74	0	7	0	7.6	2.1
MON	82	0	1	1.9	0.1	82	0	5	0	9.4	1.5
MPD	405	0	3	1.8	0.4	406	0	4	0	6.9	0.8
MPH	966	0	3	1.7	-0.6	976	0	3	0	6.6	0.9
NAF	21	0	10	1.4	0.7	22	5	14	0	6.3	1.2
NCA	688	1	5	1.9	0.7	679	0	5	0	6.9	0.9
NWA	11680	0	10	1.6	0.6	11521	0	10	0	7.1	0.6
OAE	501	0	44	1.0	-0.4	503	0	45	0	7.0	1.0
OAL	39	0	3	1.9	0.1	39	0	3	0	7.8	0.7
PAC	311	1	31	1.7	0.5	312	0	32	0	8.5	0.5
PAL	1341	0	5	1.4	0.0	1263	0	6	0	7.7	0.2
PAO	438	0	61	1.6	0.0	435	1	62	0	7.6	1.3
PUA	44	2	32	2.0	-0.4	44	0	39	0	16.8	-1.0
QFA	4103	0	54	1.4	0.3	4079	0	54	0	6.3	0.4
RAF	55	0	0	2.2	1.2	54	0	0	0	7.6	1.7
RAM	125	0	6	1.7	-0.9	125	0	9	0	8.8	1.6
RCH	238	1	19	2.2	0.9	222	0	20	0	8.9	0.3
RJA	20	5	5	1.0	-0.5	21	0	0	0	5.2	1.0
RKA	123	1	3	1.2	-0.4	121	0	3	0	6.1	0.7
ROY	283	1	5	1.7	-0.5	289	0	40	0	7.7	1.2
RRR	136	0	7	2.4	0.3	135	0	7	0	7.1	1.3
RYN	610	1	44	1.9	1.0	607	0	43	0	5.7	0.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RZO	354	2	7	1.6	-0.3	353	0	8	0	9.1	0.2
SAA	388	1	2	1.3	-0.2	387	0	5	0	7.4	1.3
SAS	1583	1	30	2.2	0.0	1566	0	28	0	6.8	0.7
SIA	661	0	3	1.5	0.3	657	0	3	0	5.4	0.4
SLR	264	0	5	1.5	-1.0	262	0	6	0	7.6	0.8
SOO	110	0	100	5.0	4.8	116	0	41	0	6.7	-0.1
SVA	118	1	3	1.4	-0.3	127	0	3	0	7.0	0.3
SWR	62	0	3	1.0	-0.1	63	0	8	0	8.2	1.3
TAM	41	0	24	2.2	0.4	42	0	24	0	10.7	1.2
TAP	749	1	6	1.4	-0.2	749	0	6	0	7.1	1.1
TBA	50	0	44	2.7	-0.5	58	0	41	0	16.5	3.4
TCU	122	1	1	1.3	-0.8	121	0	2	0	5.1	0.9
THA	359	1	7	1.6	-0.2	350	0	8	0	8.0	0.7
THT	63	2	29	2.0	0.2	61	0	26	0	7.8	1.9
THY	22	0	0	1.2	-0.8	23	0	0	0	4.5	1.2
TPA	43	0	9	1.9	0.7	43	0	9	0	10.5	0.9
TSC	348	1	4	1.8	0.5	354	0	6	0	8.2	1.5
TWA	2063	0	21	1.3	0.2	2000	0	21	0	6.3	0.9
UAL	130060	0	100	1.0	-0.1	129884	0	100	0	4.9	0.3
UPS	1434	0	23	1.3	0.3	1449	0	23	0	6.4	0.8
USA	168	0	1	1.2	0.0	145	0	1	0	5.0	1.2
VIR	594	0	2	1.6	0.0	599	0	4	0	7.9	0.5
VKG	51	0	4	1.7	-0.4	51	0	4	0	7.6	0.3
VPB	35	0	31	2.8	-1.1	34	0	29	0	8.2	2.4
VRG	347	1	31	2.4	0.6	364	1	100	0	12.1	2.8
VVR	53	0	34	2.5	0.6	74	0	35	0	6.7	0.0
WOA	179	0	7	1.8	0.7	188	0	9	0	10.6	0.6
YSS	171	2	5	1.1	0.6	169	0	5	0	6.9	1.2
AN	20666	0	17	1.2	0.3	20666	0	17	0	5.1	0.4
AR	1614	1	100	3.5	3.2	1602	0	66	0	6.4	0.4
EU	87541	0	31	1.4	0.3	87541	0	30	0	5.0	0.6
KL	9197	0	14	1.4	0.8	9143	0	14	0	5.1	0.7
LH	2646	0	10	1.9	1.4	2625	0	10	0	5.8	0.9
MK	3790	0	5	1.7	1.3	3767	0	6	0	9.0	1.1
NZ	2437	0	9	1.3	-0.2	2437	0	10	0	4.9	0.4
QF	31955	0	11	1.3	0.5	31955	0	11	0	5.5	0.7
SA	1978	0	4	1.8	1.4	1977	0	4	0	6.8	0.6
SV	1367	7	55	2.9	2.7	1367	0	57	0	9.4	0.1
WA	357	8	16	1.5	0.7	348	7	62	0	10.1	0.0
XX	4223	2	8	1.3	0.4	4775	0	58	0	9.4	1.2
N	792	2	20	2.2	0.6	822	0	19	0	8.1	1.4
US ACARS	576506	0	46	1.1	0.4	576497	0	46	0	5.4	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	474	0	15	1.1	0.0	476	0	15	0	7.6	0.9
AAR	48	8	31	1.6	-0.5	50	0	24	0	7.0	0.7
AEY	22	0	0	2.0	1.3	22	0	0	0	5.8	-0.5
AFR	64	0	8	2.2	-0.3	64	0	8	0	6.8	0.4
ANG	24	0	75	1.3	0.2	24	0	75	0	3.7	0.3
ANO	86	0	73	1.0	0.0	86	0	73	0	4.2	0.5
ANZ	168	15	36	1.3	0.2	171	1	33	0	13.6	4.1
AOM	166	1	3	1.9	1.3	170	0	4	0	7.6	0.8
ATN	32	3	13	1.6	0.7	32	0	25	0	13.4	5.4
AXF	37	0	35	0.9	-0.2	37	0	35	0	5.6	0.6
BIS	22	0	45	2.3	2.0	24	0	46	0	5.8	0.3
BWA	23	9	13	1.9	1.3	21	0	14	0	10.3	0.3
CAL	27	0	30	1.7	-0.3	33	0	27	0	7.1	-1.1
CDN	46	0	26	2.1	-0.3	46	0	26	0	7.1	0.7
CES	20	0	30	1.4	-0.5	20	0	100	0	17.8	0.0
CFC	157	4	13	2.2	1.3	162	2	9	0	7.2	1.1
CFG	34	0	15	2.0	-0.2	32	0	16	0	5.5	1.2
CLX	21	5	14	0.9	-0.1	24	0	13	0	9.4	1.8
CMI	74	1	9	2.2	0.1	76	1	8	0	8.4	2.7
COA	238	0	26	1.0	0.3	234	0	29	0	9.3	0.5
CRL	46	4	28	1.5	0.6	46	0	26	0	7.4	-0.8
CTM	28	0	29	5.1	-4.7	28	0	7	0	4.3	0.6
CUB	43	2	2	1.7	1.2	44	0	5	0	8.3	0.5
DAF	37	5	11	4.3	2.7	37	0	3	0	5.9	-0.4
DAL	203	0	37	1.1	0.2	197	1	39	0	4.9	0.5
DBY	23	0	0	1.0	-0.3	23	0	0	0	5.1	1.4
DHL	68	0	54	6.2	-6.0	72	0	11	0	11.5	3.5
DLH	215	0	11	1.6	0.4	217	0	13	0	9.0	0.4
EIA	66	0	39	1.3	0.6	64	0	41	0	9.8	1.9
EVA	132	0	23	1.7	-0.9	131	0	22	0	5.7	0.6
EWW	82	5	6	1.0	0.6	85	0	2	0	7.4	0.4
FDX	534	1	7	1.3	0.5	536	0	8	0	7.7	0.8
FIN	30	0	0	0.8	0.4	29	0	3	0	6.3	0.7
FWQ	121	3	56	1.2	0.2	121	0	55	0	5.5	-0.3
FXI	57	5	19	3.2	2.0	59	0	10	0	11.1	1.4
GAF	61	5	5	1.0	0.2	61	2	2	0	4.5	0.3
GCO	218	0	2	1.1	0.3	221	0	100	0	16.7	6.0
GHA	62	3	8	1.8	0.3	61	0	7	0	9.0	1.5
GTI	32	0	13	1.2	0.0	36	0	11	0	6.7	0.6
HAL	169	2	43	1.3	0.2	169	0	42	0	6.1	1.5
HRH	32	0	69	0.9	0.1	32	9	75	0	13.3	8.9
IBE	96	0	23	2.2	0.8	98	0	21	0	7.4	2.1
ICE	54	0	0	1.3	-0.1	54	0	0	0	7.0	1.7
JAL	73	4	5	1.3	0.2	71	0	4	0	8.7	0.9
JAZ	126	2	3	1.9	1.4	125	0	0	0	5.8	0.5
JMC	32	0	13	2.5	1.0	31	0	10	0	7.5	0.8
KAL	211	19	39	1.4	-0.6	201	0	29	0	9.5	2.0
KIW	40	0	33	2.8	1.6	40	0	33	0	14.5	0.5
KLM	79	1	10	1.1	0.6	83	0	8	0	6.1	0.5
LIB	34	0	0	1.2	0.8	34	0	3	0	7.3	0.5
LTU	56	2	7	1.6	0.1	55	0	7	0	5.8	0.9
MAS	59	3	20	1.1	-0.2	58	0	21	0	8.0	1.2
MPH	47	0	9	1.7	-0.5	46	0	7	0	6.4	0.8
NAT	24	0	4	0.9	0.1	24	0	4	0	6.3	0.3
NCA	108	0	1	1.8	0.4	108	0	2	0	7.6	0.9
NWA	425	2	13	1.8	0.3	421	0	11	0	7.7	0.5
PAC	57	4	14	1.8	1.0	58	0	12	0	6.3	1.2
PAL	90	3	10	1.4	-0.4	80	0	8	0	5.6	0.6
PAO	25	0	60	0.6	-0.3	25	0	60	0	4.8	1.8

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
QFA	183	10	52	1.1	0.3	183	0	50	0	10.0	2.1
RCH	208	1	21	2.2	0.9	210	0	20	0	11.4	3.0
RRR	199	3	18	4.3	3.6	193	1	9	0	6.4	0.3
SAA	72	3	7	1.6	-0.6	70	0	4	0	5.4	0.4
SAS	56	0	21	1.4	0.1	56	0	20	0	7.5	1.9
SIA	53	0	6	1.1	0.1	52	0	6	0	5.0	0.0
SWR	64	0	6	0.9	0.2	65	0	15	0	13.9	5.9
UAL	200661	0	100	1.2	-0.1	200377	0	100	0	4.0	0.4
UPS	139	1	20	1.5	0.4	140	0	19	0	6.2	0.0
VHJ	110	1	1	2.1	-0.2	110	0	1	0	8.3	0.1
VTA	48	0	15	2.5	-1.0	49	0	14	0	5.3	1.2
VVP	51	2	29	2.7	-0.5	54	0	22	0	6.2	0.3
WOA	23	0	4	1.0	0.2	23	0	4	0	5.5	0.7
AN	72211	0	67	1.2	0.1	72211	0	67	0	4.2	0.3
AR	1124	5	100	2.5	1.8	1120	0	81	0	5.0	0.6
EU	574094	0	80	1.0	0.1	573376	0	80	0	3.8	0.0
KL	6477	0	57	1.3	0.5	6443	0	57	0	3.7	0.2
LH	1026	0	65	1.4	0.4	1022	0	65	0	4.0	0.7
MK	3237	0	50	1.5	0.5	3211	0	50	0	7.4	1.0
NZ	7386	0	56	1.4	0.4	7385	0	57	0	5.0	0.1
QF	25766	0	57	1.1	0.5	25768	0	57	0	4.4	0.0
SA	1727	0	58	1.3	0.2	1722	0	58	0	5.6	1.3
SV	2479	4	77	3.4	3.1	2470	0	76	0	6.2	1.6
WA	51	24	31	1.7	0.9	50	4	72	0	12.0	-2.3
XX	765	5	10	1.8	0.2	798	0	54	0	11.7	1.8
US ACARS	535838	0	51	1.2	0.3	533643	0	53	0	4.5	0.4

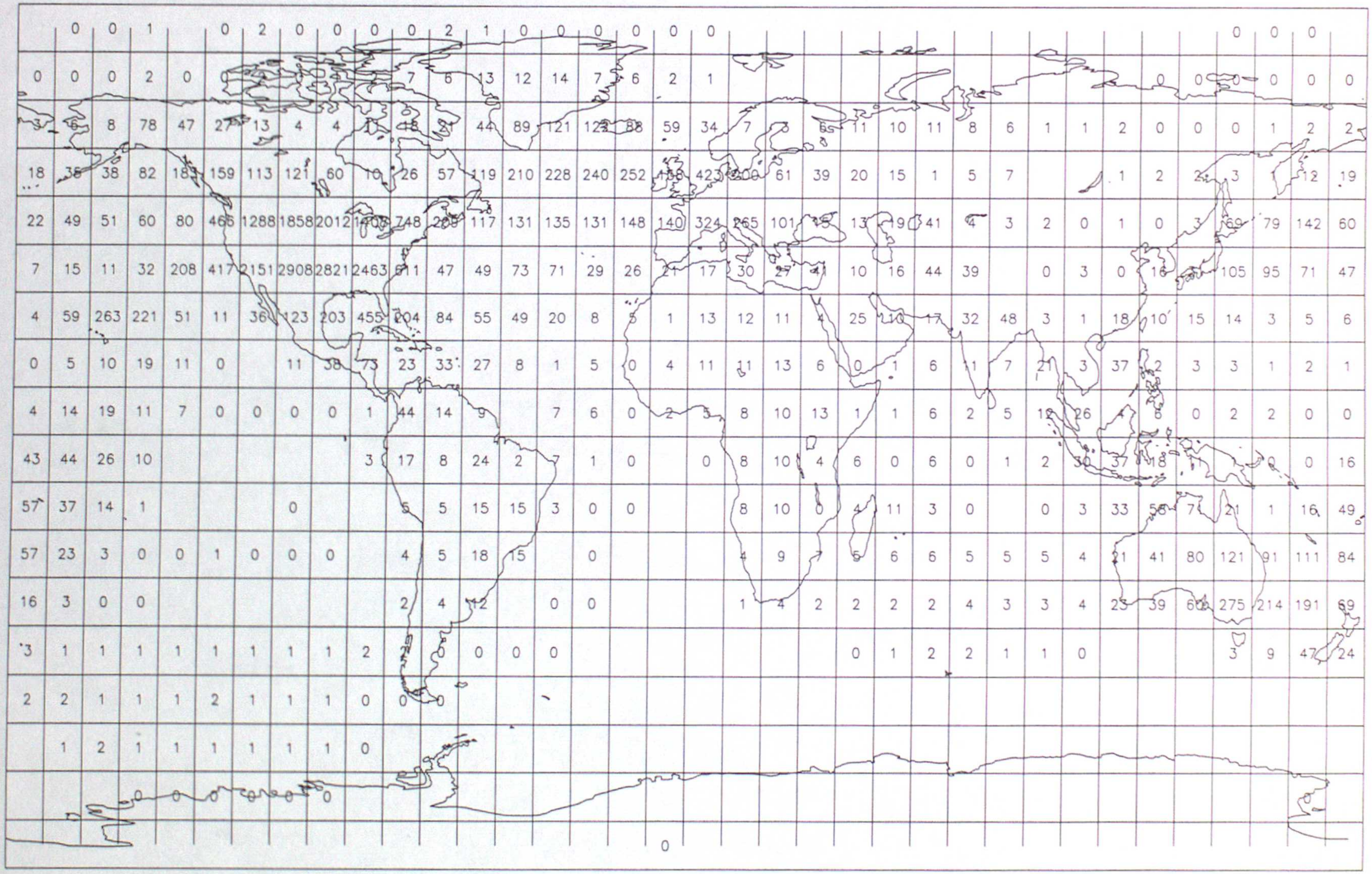
MEAN DAILY COUNT OF AIRCRAFT 300 – 150 HPA

JULY 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 31929

FIGURE 3A



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3 1 1 1 1 1 1 1 1 2 2 0 0 0 0 0 1 2 2 1 1 0 3 9 47 24
2 2 1 1 1 2 1 1 1 0 0 0
1 2 1 1 1 1 1 1 0
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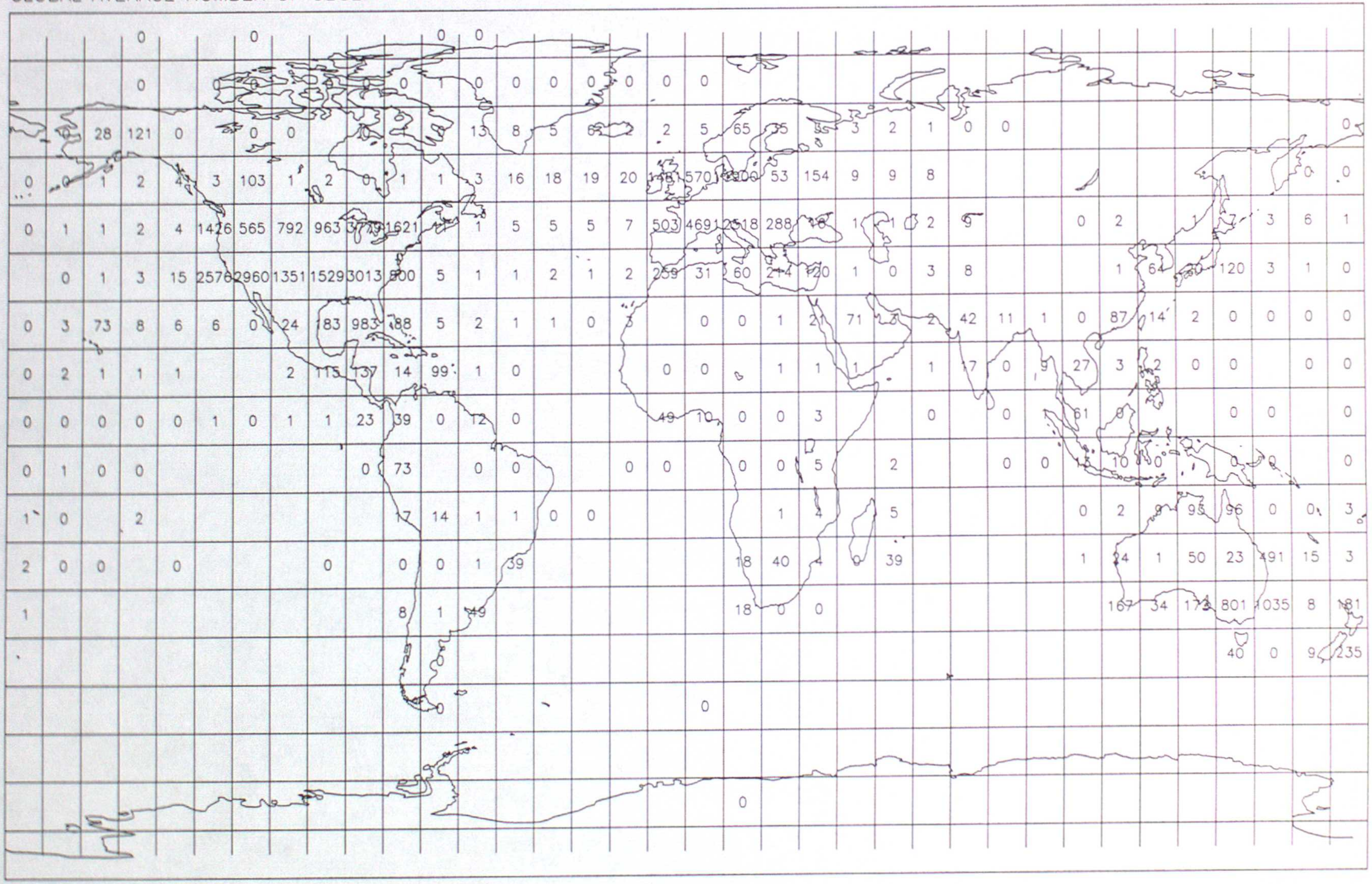
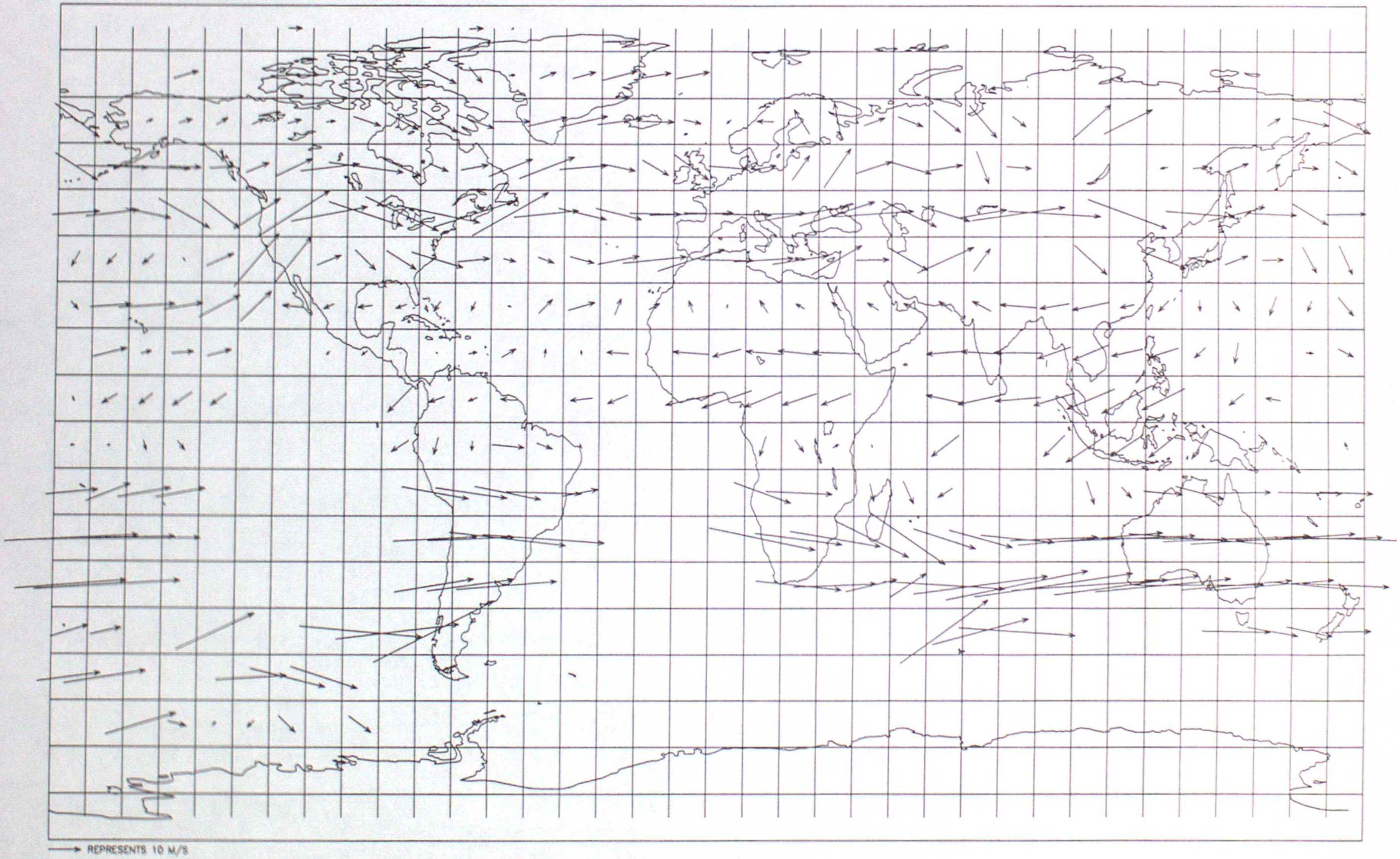
0

MEAN DAILY COUNT OF AIRCRAFT 1000 – 301 HPA
JULY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 46353

FIGURE 3B



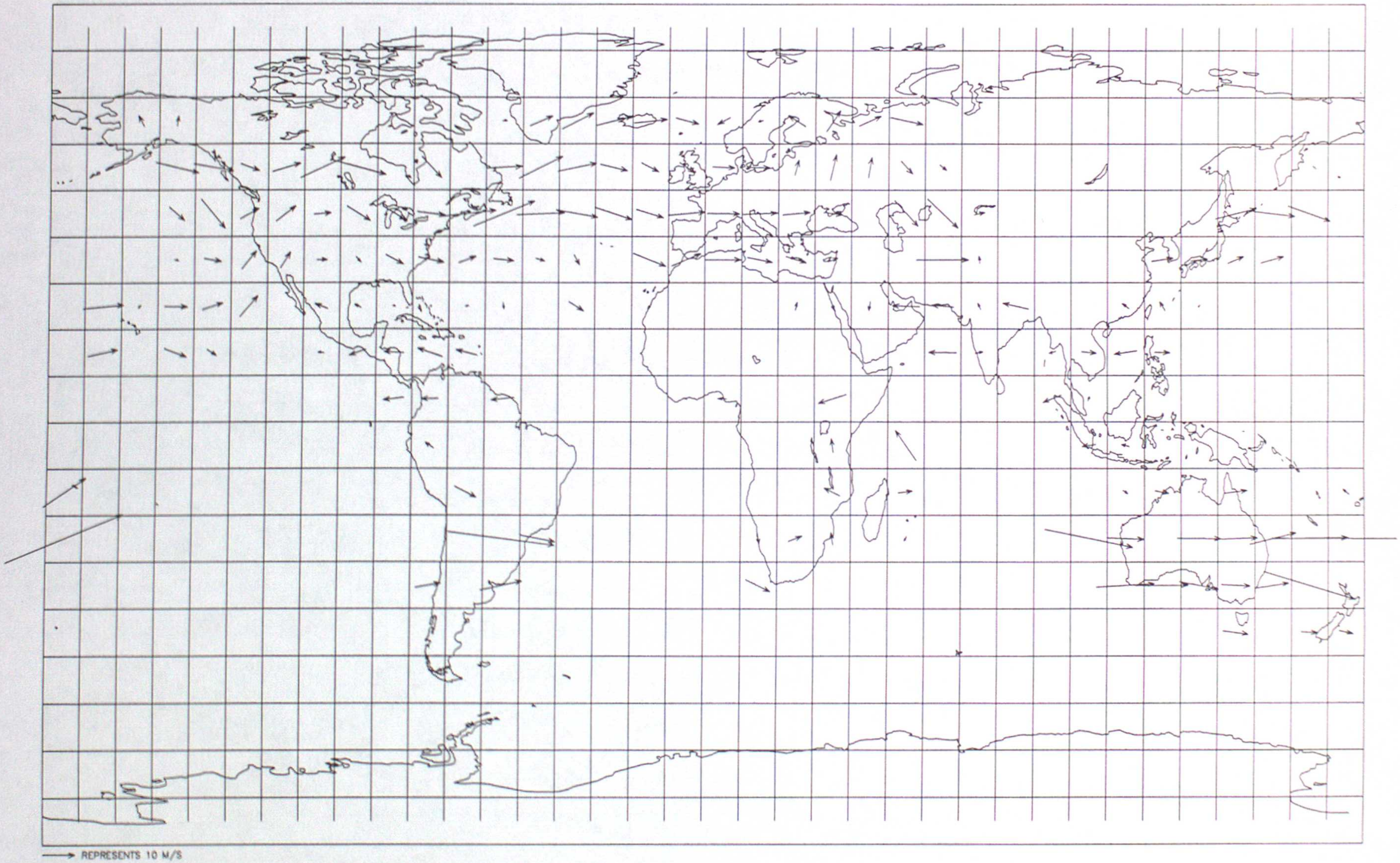
AIRCRAFT MEAN WINDS BETWEEN 300 AND 150 HPA FIGURE 4A
JULY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT MEAN WINDS BETWEEN 1000 AND 301 HPA

FIGURE 4B

JULY 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



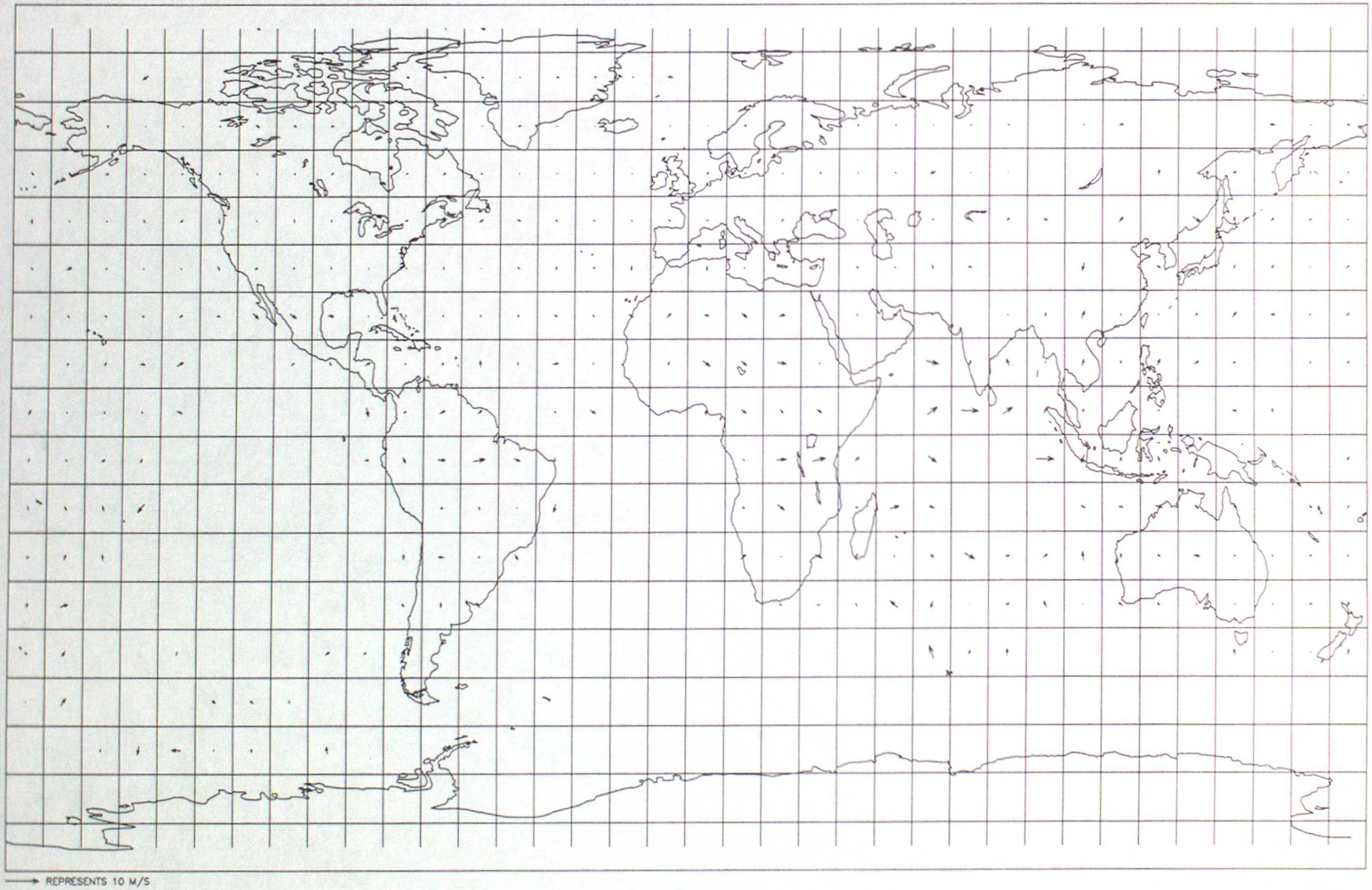
AIRCRAFT MEAN O–B WINDS BETWEEN 300 AND 150 HPA

FIGURE 5A

JULY 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



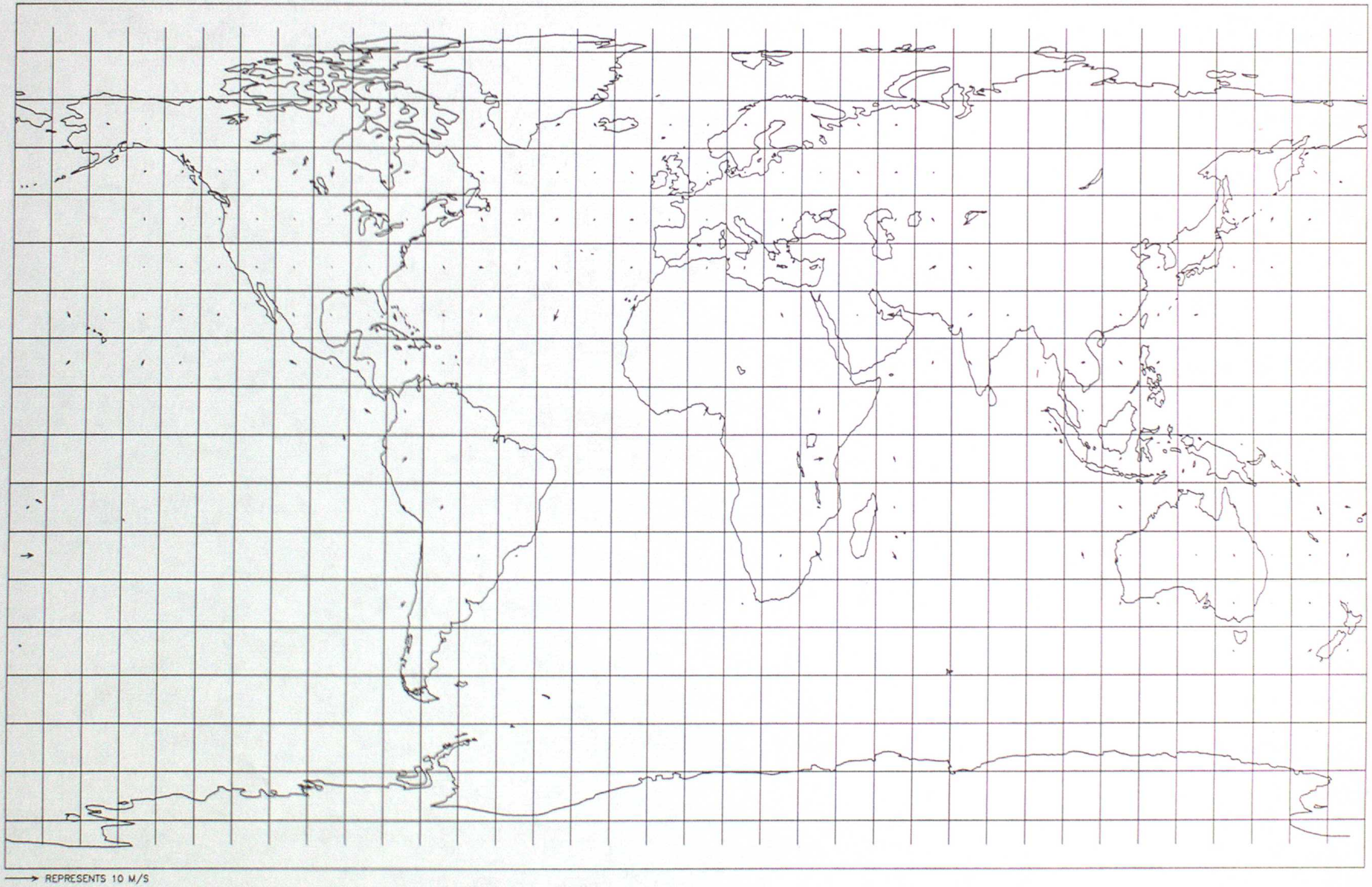
AIRCRAFT MEAN O-B WINDS BETWEEN 1000 AND 301 HPA

FIGURE 5B

JULY 2000

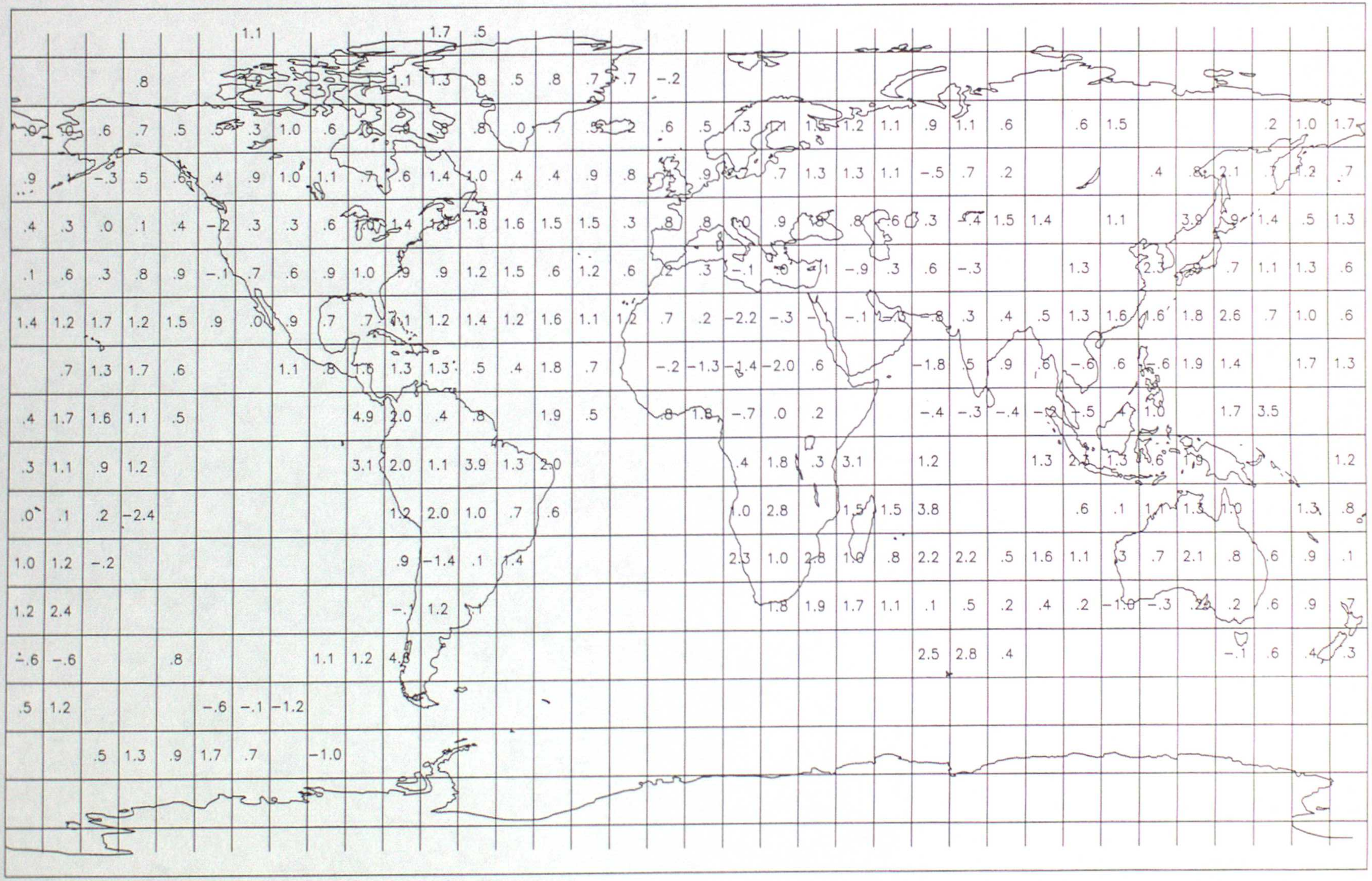
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) 300 – 150 HPA
JULY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 6A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.4 .3 .0 .1 .4 –.2 .3 .3 .6 1.0 1.4 1.8 1.8 1.6 1.5 1.5 .3 .8 .8 1.0 .9 1.8 .8 .6 .3 .4 1.5 1.4 1.1 3.9 .9 1.4 .5 1.3
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1.4 1.2 1.7 1.2 1.5 .9 .0 .9 .7 .7 1.1 1.2 1.4 1.2 1.6 1.1 1.2 .7 .2 –2.2 –.3 –.1 –.1 –.3 –.8 .3 .4 .5 1.3 1.6 1.6 1.8 2.6 .7 1.0 .6
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.0 .1 .2 –2.4 1.2 2.0 1.0 .7 .6 1.0 2.8 1.5 1.5 3.8 .6 .1 1.1 1.3 1.0 1.3 .8
1.0 1.2 –.2 .9 –1.4 .1 1.4 2.3 1.0 2.8 1.0 .8 2.2 2.2 .5 1.6 1.1 .3 .7 2.1 .8 .6 .9 .1
1.2 2.4 –.1 1.2 .1 1.8 1.9 1.7 1.1 .1 .5 .2 .4 .2 –1.0 –.3 .2 .2 .6 .9 .7
–.6 –.6 .8 1.1 1.2 4.8 2.5 2.8 .4 –.1 .6 .4 .3
.5 1.2 –.6 –.1 –1.2
.5 1.3 .9 1.7 .7 –1.0

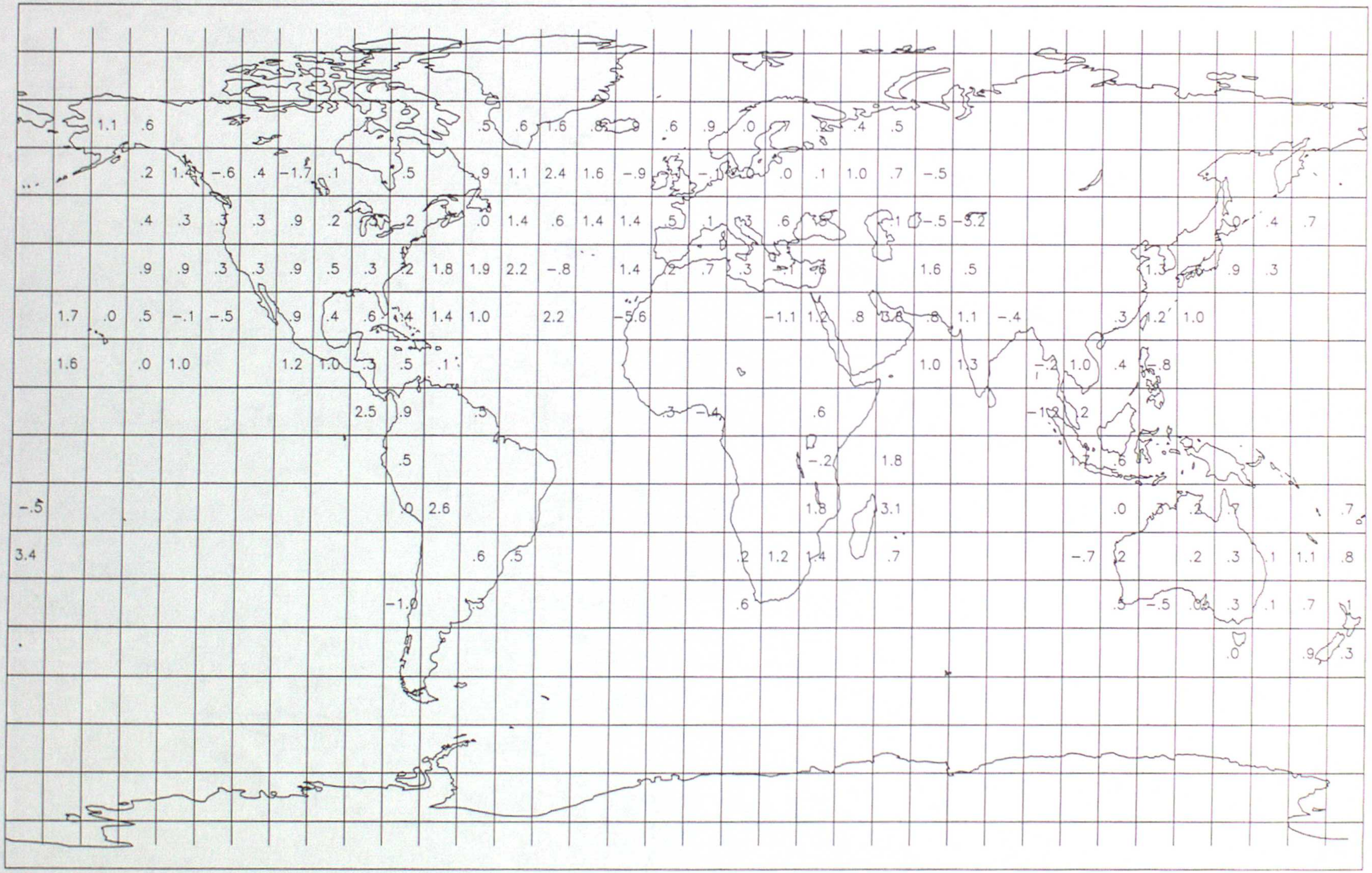
AIRCRAFT : MEAN O-B SPEEDS (M/S) 1000 - 301 HPA

FIGURE 6B

JULY 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.1 .6 .5 .6 1.6 .8 .9 .6 .9 .0 .7 .2 .4 .5
.2 1.4 -.6 .4 -1.7 .1 .5 .9 1.1 2.4 1.6 -.9 -.1 .0 .0 .1 1.0 .7 -.5
.4 .3 .3 .3 .9 .2 .3 .2 .0 1.4 .6 1.4 1.4 .5 .1 .3 .6 .5 .1 .0 -.5 -3.2 .0 .4 .7
.9 .9 .3 .3 .9 .5 .3 .2 1.8 1.9 2.2 -.8 1.4 .2 .7 .3 -.1 .6 1.6 .5 1.3 .9 .3
1.7 .0 .5 -.1 -.5 .9 .4 .6 .4 1.4 1.0 2.2 -5.6 -1.1 1.2 .8 3.8 .8 1.1 -.4 .3 1.2 1.0
1.6 .0 1.0 1.2 1.0 .3 .5 .1 1.0 1.3 -.2 1.0 .4 -.8
2.5 .9 .5 .3 -.4 .6 -1.2 .2
.5 -.2 1.8 1.7 .6
-.5 .0 2.6 1.8 3.1 .0 .3 .2 .7 .7
3.4 .6 .5 .2 1.2 1.4 .7 -.7 .2 .2 .3 .1 1.1 .8
-1.0 .3 .6 .5 -.5 .0 .3 .1 .7 .1
.0 .9 .3

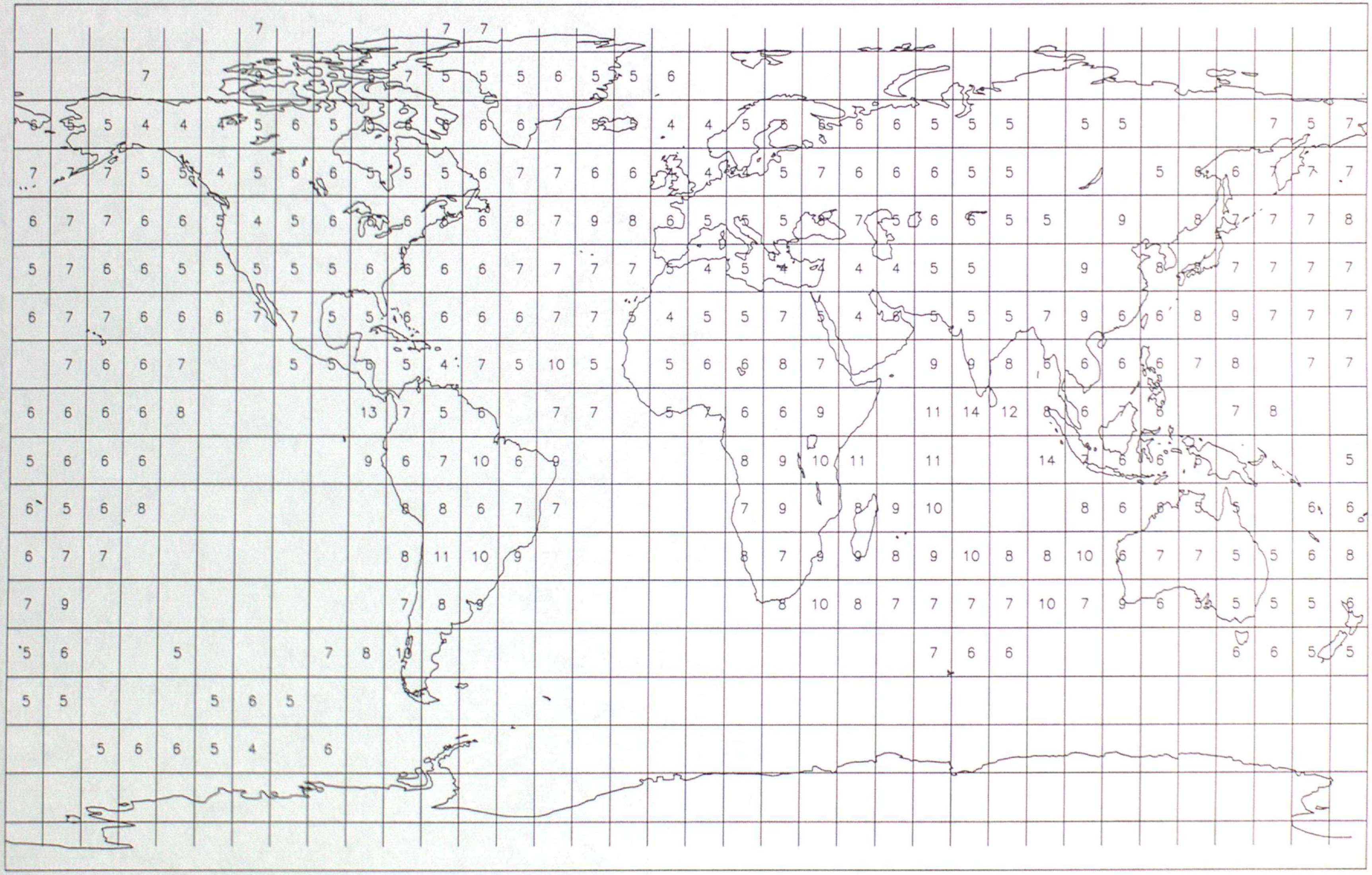
AIRCRAFT : RMS O-B VECTOR (M/S) 300 – 150 HPA

FIGURE 7A

JULY 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


7 7 7
7 7 5 5 5 6 5 5 6
6 5 5 4 4 4 5 6 5 6 6 6 7 5 5 4 4 5 6 6 6 6 5 5 5 5 5 7 5 7
7 7 7 5 5 4 5 6 6 5 5 6 7 7 6 6 4 4 5 7 6 6 6 5 5 5 6 6 7 7 7
6 7 7 6 6 5 4 5 6 6 6 6 8 7 9 8 6 5 5 5 6 7 5 6 6 5 5 9 8 7 7 8
5 7 6 6 5 5 5 5 5 6 6 6 6 7 7 7 7 5 4 5 4 4 4 4 5 5 9 8 7 7 7 7
6 7 7 6 6 6 7 7 5 5 6 6 6 6 7 7 5 4 5 5 7 5 4 6 5 5 5 7 9 6 6 8 9 7 7 7
7 6 6 7 5 5 5 5 4 7 5 10 5 5 6 6 8 7 9 9 8 5 6 6 6 7 8 7 7
6 6 6 6 8 13 7 5 6 7 7 5 7 6 6 9 11 14 12 8 6 7 6 7 8
5 6 6 6 9 6 7 10 6 9 8 9 10 11 11 14 6 6 6 5
6 5 6 8 8 8 6 7 7 7 9 8 9 10 8 6 8 5 5 6 6
6 7 7 8 11 10 9 8 7 9 9 8 9 10 8 8 10 6 7 7 5 5 6 8
7 9 7 8 9 8 10 8 7 7 7 7 10 7 9 6 5 5 5 5 6
5 6 5 7 8 10 7 6 6 6 6 5 5
5 5 5 6 5
5 6 6 5 4 6

AIRCRAFT : RMS O–B VECTOR (M/S) 1000 – 301 HPA FIGURE 7B
JULY 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

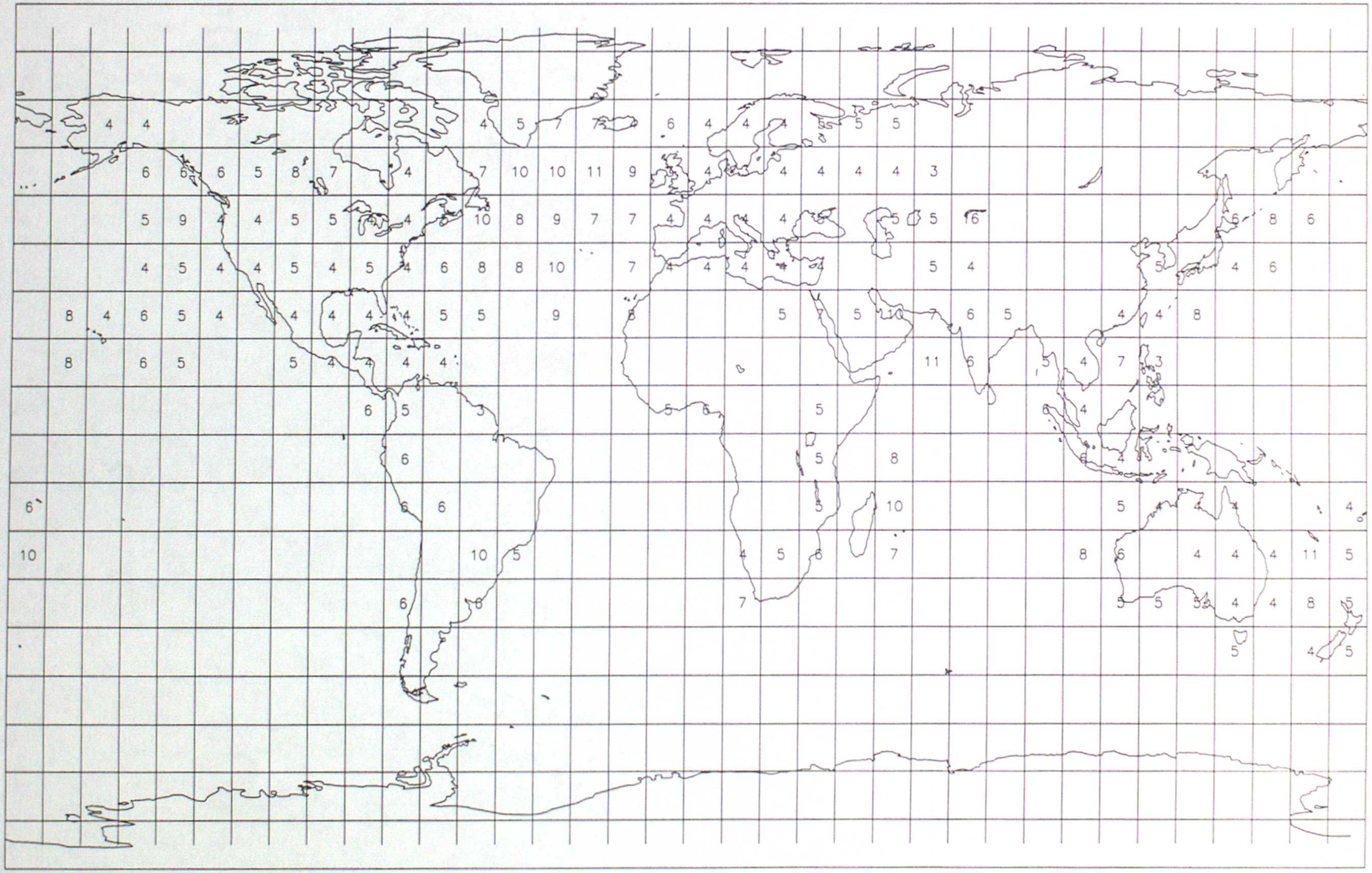

4 4 4 5 7 7 6 4 4 4 5 5 5
6 6 6 5 8 7 4 7 10 10 11 9 4 4 4 4 4 3
5 9 4 4 5 5 4 4 6 10 8 9 7 7 4 4 4 4 5 5 5 16 6 8 6
4 5 4 4 5 4 5 4 6 8 8 10 7 4 4 4 4 4 5 4 5 4 6
8 4 6 5 4 4 4 4 4 5 5 9 8 5 7 5 10 7 6 5 4 4 8
8 6 5 5 4 4 4 4 11 6 5 4 7 3
6 5 3 5 6 5 6 4
6 5 8 4
6 6 6 5 10 5 4 4 4 4
10 10 5 4 5 6 7 8 6 4 4 4 11 5
6 6 7 5 5 5 4 4 8 5
5 4 5

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
25563	00	Z	150	65/ 178	15	0	104.1	-78.0	130.1	4
42101	00	Z	400	30/ 76	25	0	56.1	-13.4	57.6	4
42101	12	Z	100	30/ 76	17	1	73.4	160.4	176.3	4
42314	00	Z	150	27/ 95	17	0	99.1	59.2	115.5	4
42314	12	Z	200	27/ 95	14	0	81.9	39.6	91.0	4
42339	00	Z	150	26/ 73	23	0	103.0	-11.1	103.6	5
42339	12	Z	100	26/ 73	12	0	135.9	50.7	145.0	5
42361	12	Z	200	26/ 78	11	0	97.3	65.0	117.0	4
42369	12	Z	70	27/ 81	13	0	124.6	117.1	171.0	6
42397	00	Z	400	27/ 88	13	0	42.6	-58.3	72.2	6
42647	12	Z	100	23/ 73	11	2	92.8	129.6	159.4	6
43003	00	Z	150	19/ 73	12	2	77.4	116.8	140.2	5
43003	12	Z	200	19/ 73	8	7	83.8	151.6	173.2	6
43014	12	Z	100	20/ 75	9	1	90.3	171.6	193.9	7
43185	00	Z	100	16/ 81	20	0	126.7	23.8	128.9	4
43185	12	Z	100	16/ 81	18	1	88.1	107.2	138.8	4
43346	12	Z	100	11/ 80	19	0	101.5	131.9	166.4	4
43369	12	Z	100	8/ 73	12	1	107.7	94.5	143.3	4
56571	00	Z	1000	28/ 102	16	13	8.3	90.4	90.8	4
84628	12	Z	850	-12/ -77	22	0	8.0	-78.9	79.3	8
97180	00	Z	200	-5/ 120	12	1	77.9	-55.5	95.6	5
97560	00	Z	400	-1/ 136	26	1	25.3	-59.5	64.7	7

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – JULY 2000
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1093

FIGURE 8

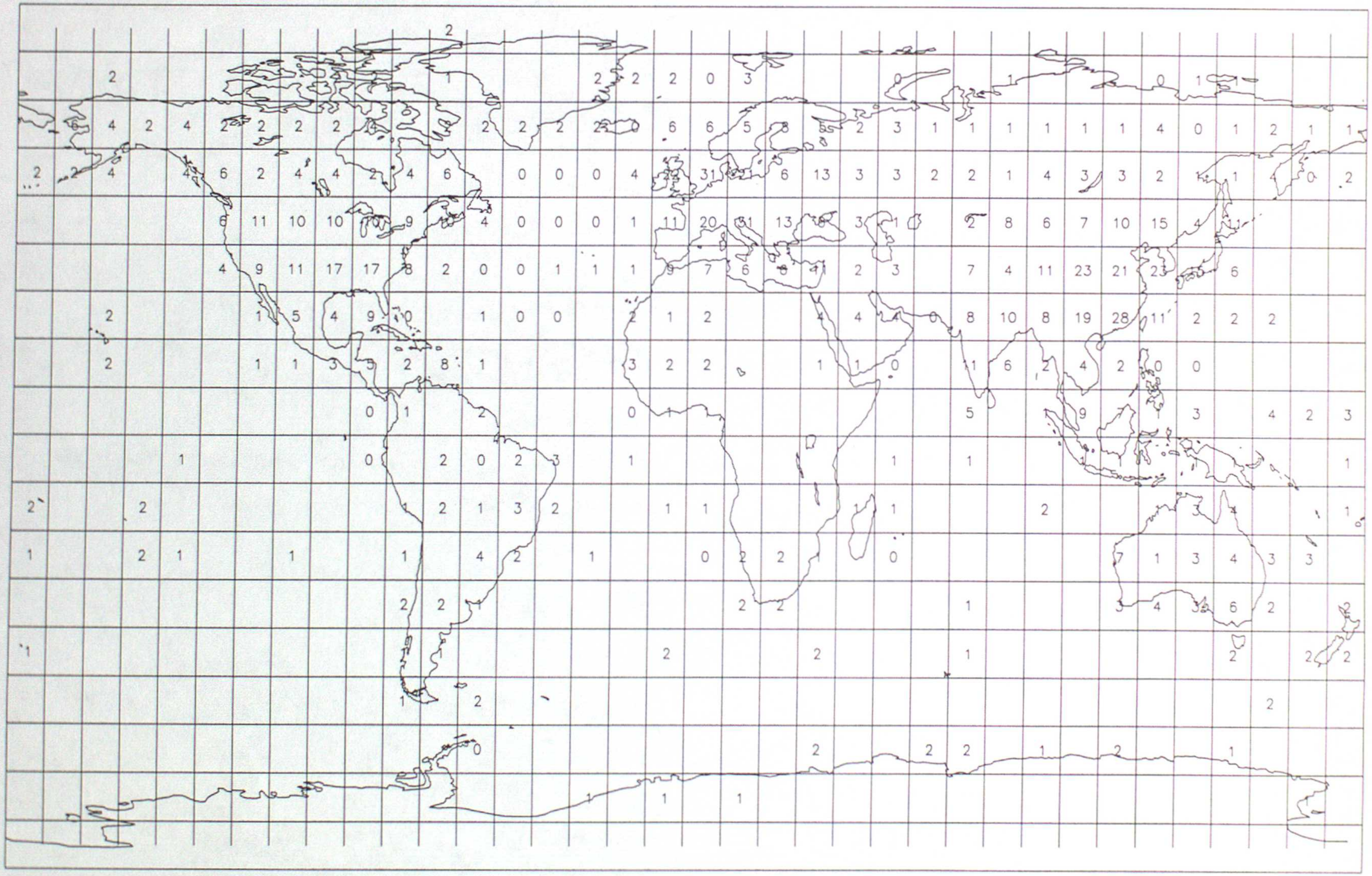


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
48568	12	V	150	7/ 101	21	0	33	13.6	9.8	19.3	1
68263	12	V	200	-26/ 28	15	0	20	-5.8	2.6	25.7	1
68461	12	V	200	-28/ 28	14	0	0	-12.0	4.0	18.4	1
68588	12	V	100	-30/ 31	19	0	0	-18.5	2.5	20.9	1
68842	12	V	100	-34/ 26	10	0	30	-16.1	4.0	20.3	1
83612	12	V	150	-20/ -55	15	0	100	11.1	-5.5	21.4	3

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – JULY 2000 FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1261

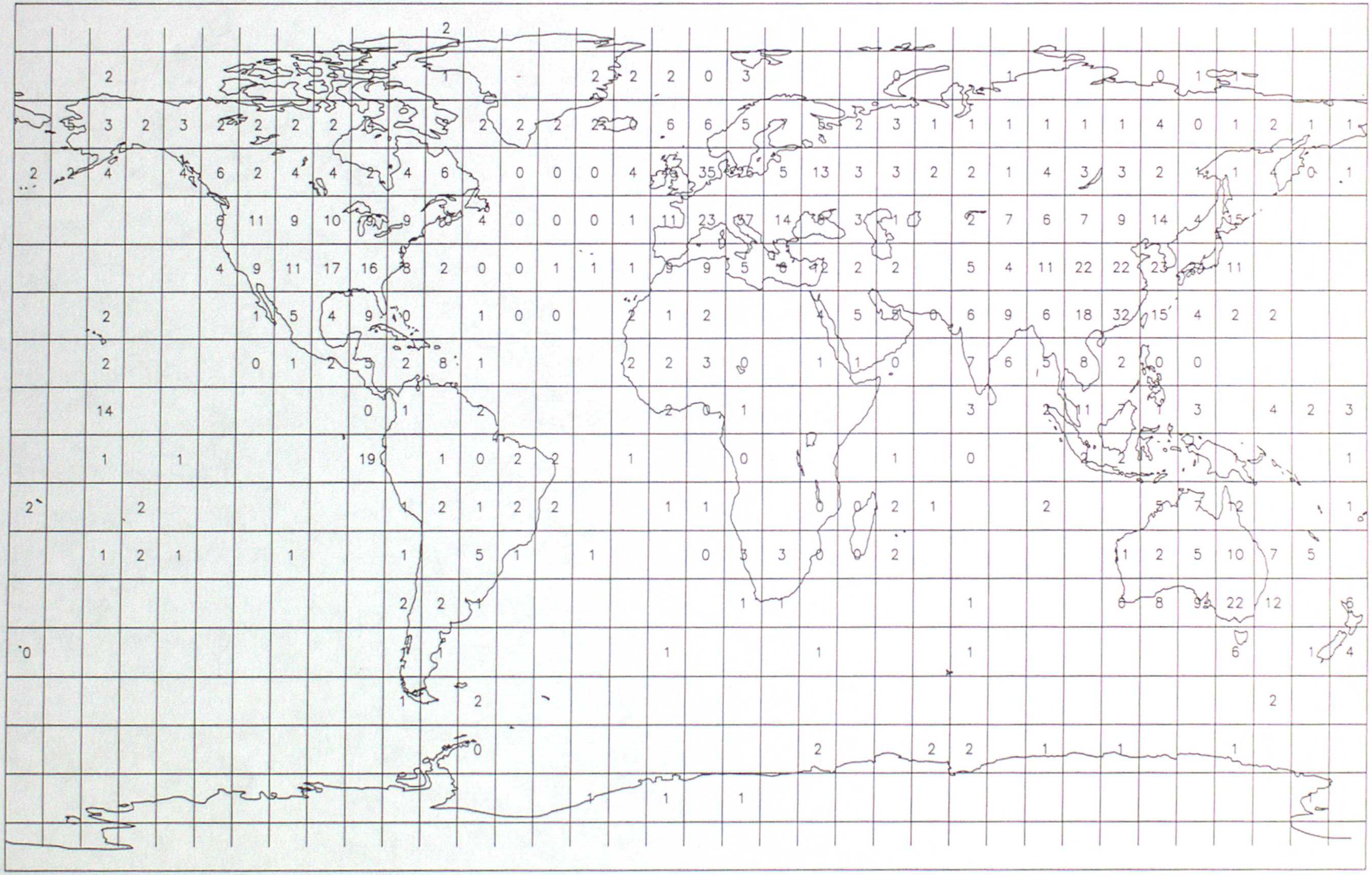

2
2 1 - 2 2 2 0 3 0 1 0 1 1
3 2 3 2 2 2 2 2 2 2 2 6 6 5 5 2 3 1 1 1 1 1 1 4 0 1 2 1 1
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 35 5 13 3 3 2 2 1 4 3 3 2 1 1 0 1
6 11 9 10 9 9 4 0 0 0 1 11 23 37 14 3 1 2 7 6 7 9 14 4 5
4 9 11 17 16 8 2 0 0 1 1 1 9 9 5 12 2 2 5 4 11 22 22 23 11
2 1 5 4 9 0 1 0 0 2 1 2 4 5 5 0 6 9 6 18 32 15 4 2 2
2 0 1 2 5 2 8 1 2 2 3 0 1 1 0 7 6 5 8 2 0 0
14 0 1 2 2 0 1 3 2 11 7 1 3 4 2 3
1 1 19 1 0 2 2 1 0 1 0 2 1
2 2 1 2 1 2 2 1 1 0 0 2 1 2 5 7 12 1
1 2 1 1 1 5 1 1 0 3 3 0 0 2 1 2 5 10 7 5
2 2 1 1 1 1 6 8 9 22 12 6
0 1 1 1 1 6 1 4
1 2 2
0 2 2 2 1 1 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17280	12	DD	38/ 40	11	-11.4	8.1	11.1
42369	12	DD	27/ 81	11	16.4	6.0	29.8
42397	12	DD	27/ 88	5	13.8	9.3	18.1
42809	00	DD	23/ 88	22	11.6	4.1	15.3
44292	00	DD	48/ 107	24	10.2	3.0	11.7
48455	00	DD	14/ 101	20	10.1	8.2	20.1
62337	12	DD	31/ 34	12	-20.8	7.9	17.6
72293	12	DD	33/-117	26	11.2	4.3	13.3
78866	00	DD	18/ -63	11	-10.8	5.6	17.9
83612	12	DD	-20/ -55	18	12.1	7.0	21.4
96441	00	DD	3/ 113	22	10.0	6.4	22.9

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

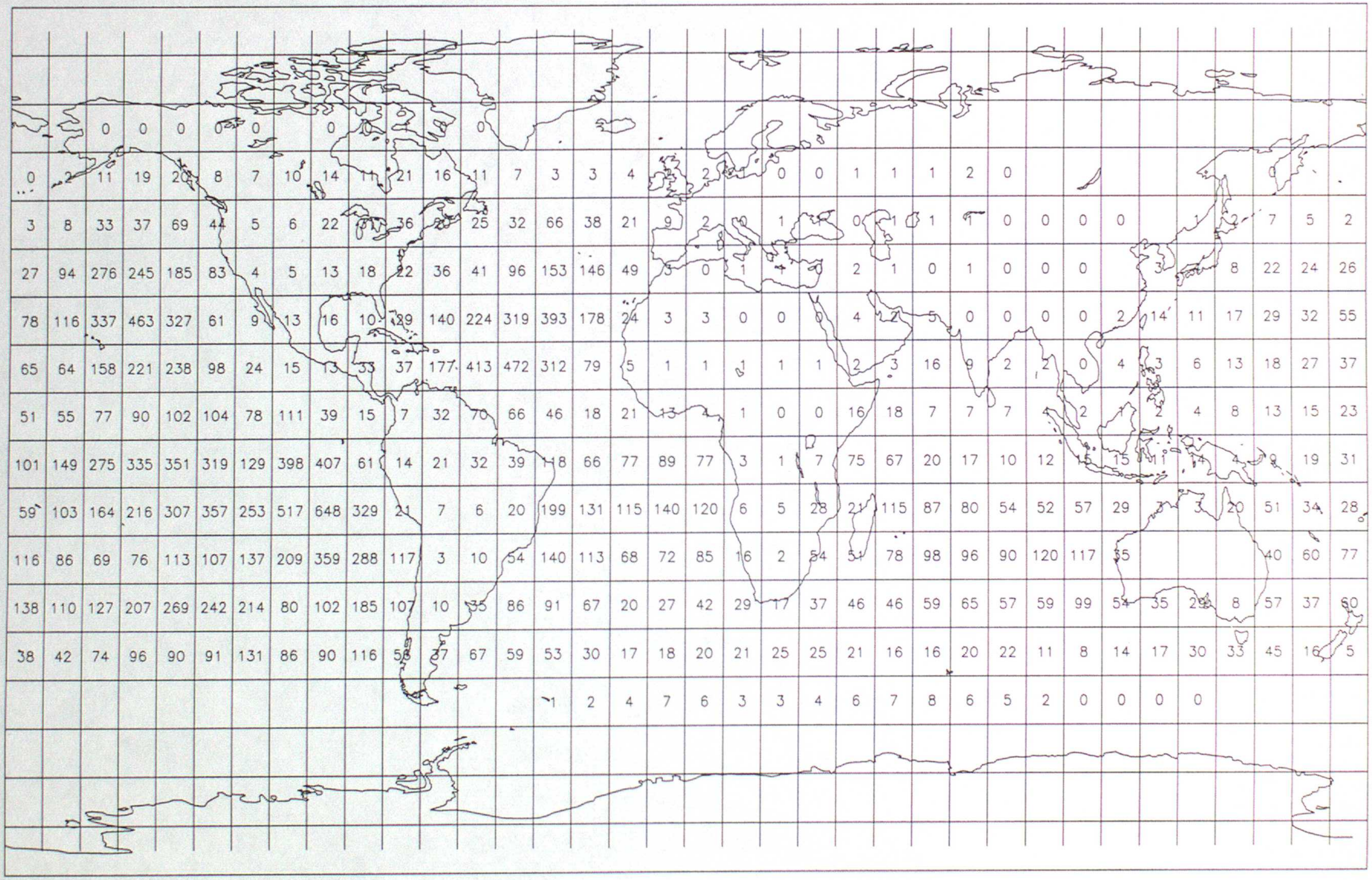
MONTH: JULY 2000

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JULY 2000

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 24410



		0	0	0	0	0		0	0			0																							
0	2	11	19	20	8	7	10	14	11	21	16	11	7	3	3	4		2		0	0	1	1	1	2	0							0		
3	8	33	37	69	44	5	6	22	31	36	20	25	32	66	38	21	9	2	0	1	1	0	1	1	1	0	0	0	0		1	2	7	5	2
27	94	276	245	185	83	4	5	13	18	22	36	41	96	153	146	49	3	0	1	1	0	2	1	0	1	0	0	0		3		8	22	24	26
78	116	337	463	327	61	9	13	16	10	29	140	224	319	393	178	24	3	3	0	0	0	4	2	5	0	0	0	0	2	14	11	17	29	32	55
65	64	158	221	238	98	24	15	13	33	37	177	413	472	312	79	5	1	1	1	1	1	2	3	16	9	2	2	0	4	3	6	13	18	27	37
51	55	77	90	102	104	78	111	39	15	7	32	70	66	46	18	21	13	4	1	0	0	16	18	7	7	7	4	2	1	2	4	8	13	15	23
101	149	275	335	351	319	129	398	407	61	14	21	32	39	118	66	77	89	77	3	1	7	75	67	20	17	10	12	15	15	11	14	4	9	19	31
59	103	164	216	307	357	253	517	648	329	21	7	6	20	199	131	115	140	120	6	5	28	21	115	87	80	54	52	57	29	3	3	20	51	34	28
116	86	69	76	113	107	137	209	359	288	117	3	10	54	140	113	68	72	85	16	2	54	51	78	98	96	90	120	117	35				40	60	77
138	110	127	207	269	242	214	80	102	185	107	10	35	86	91	67	20	27	42	29	17	37	46	46	59	65	57	59	99	54	35	29	8	57	37	60
38	42	74	96	90	91	131	86	90	116	58	37	67	59	53	30	17	18	20	21	25	25	21	16	16	20	22	11	8	14	17	30	33	45	16	5
														1	2	4	7	6	3	3	4	6	7	8	6	5	2	0	0	0	0				

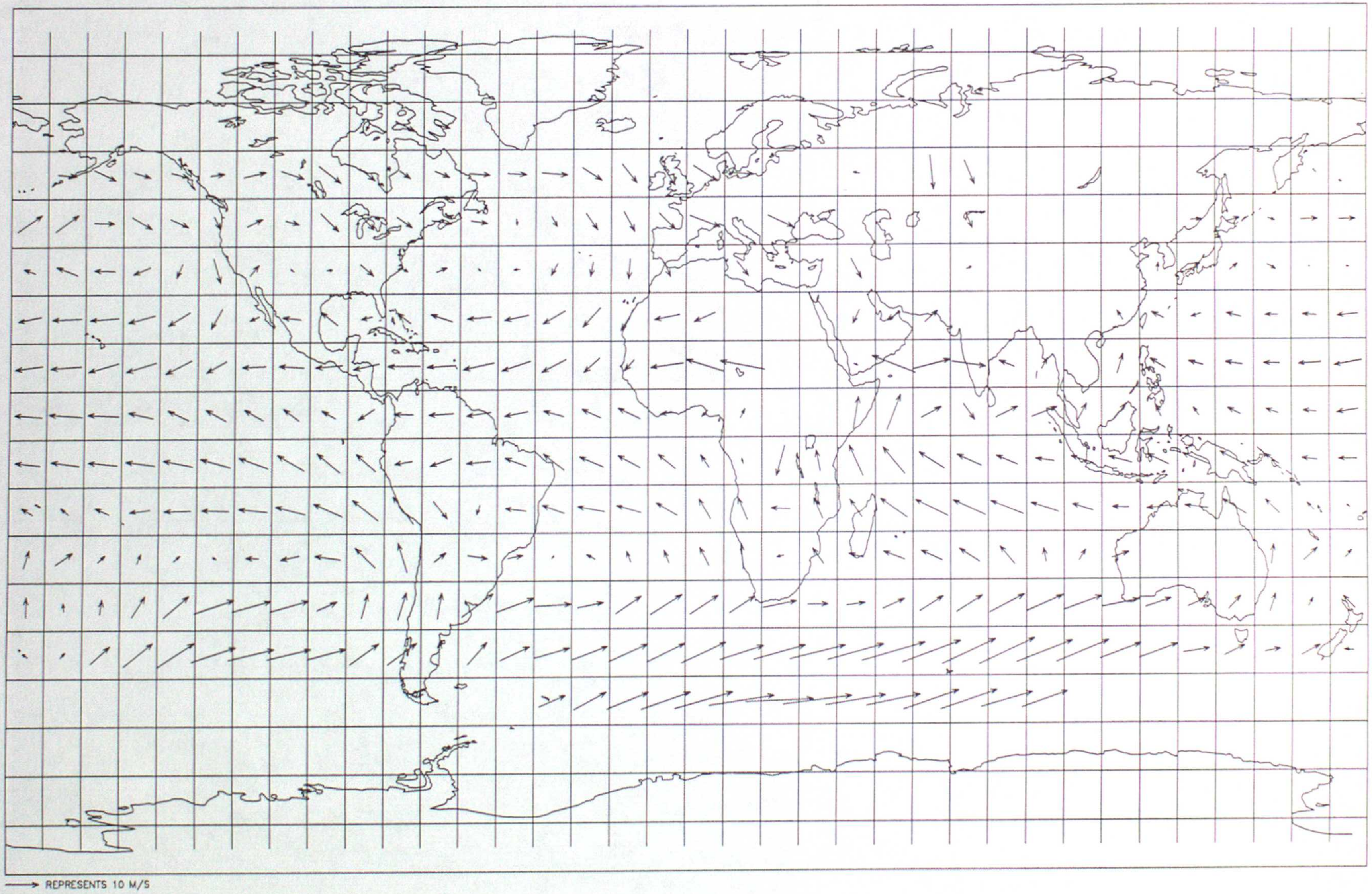
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

JULY 2000

ALL OBSERVATIONS

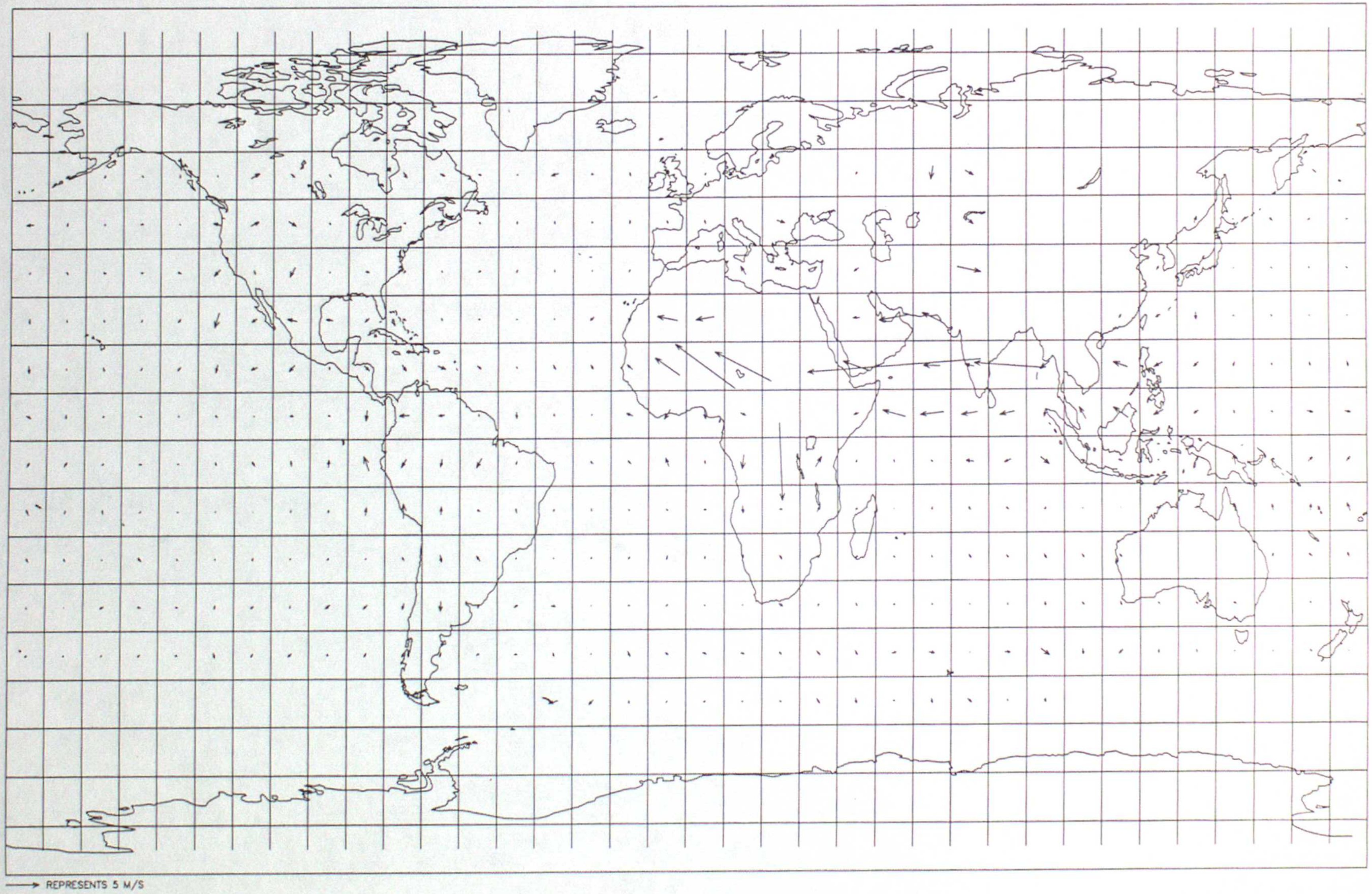
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11

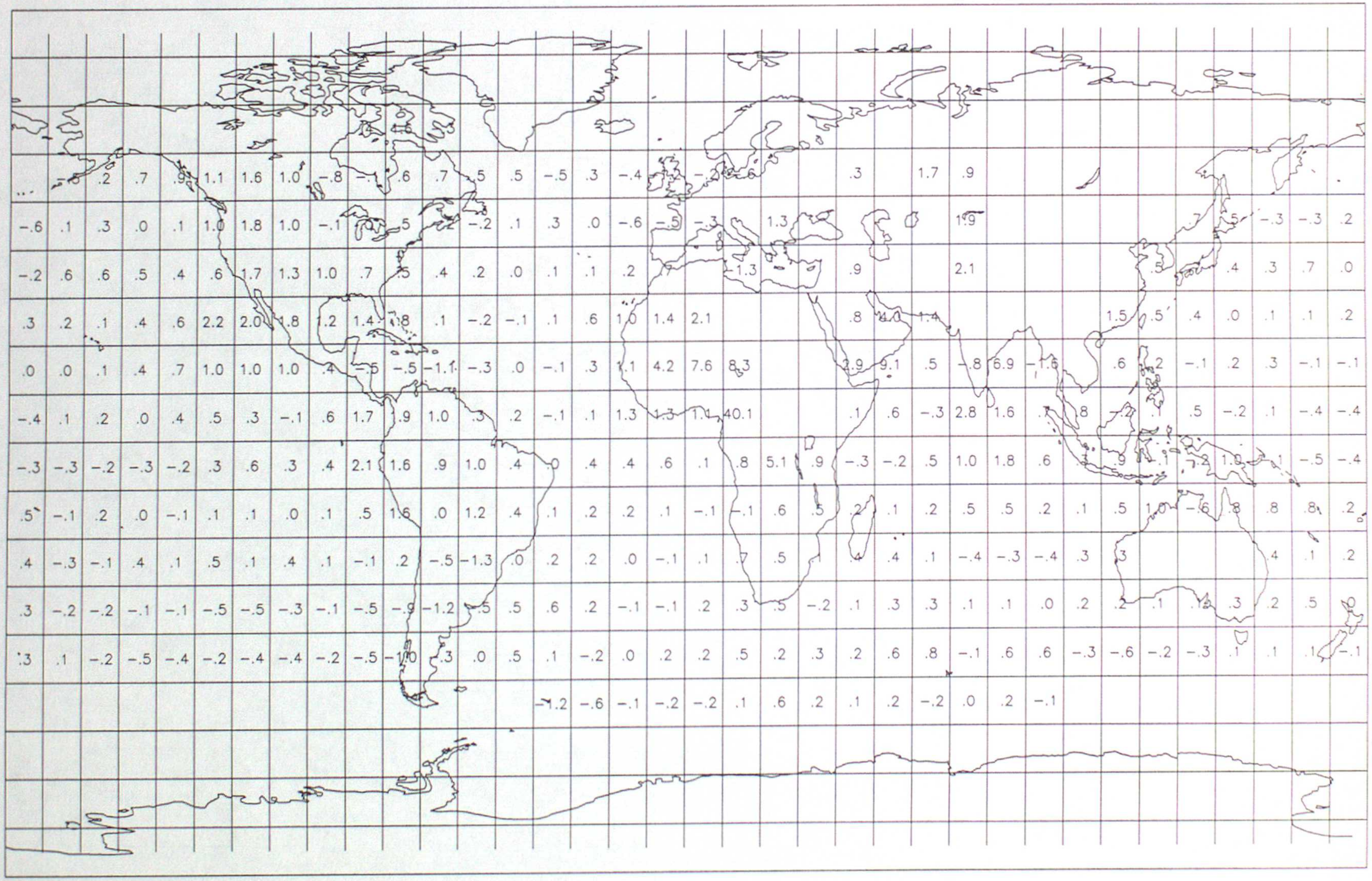

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA
JULY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

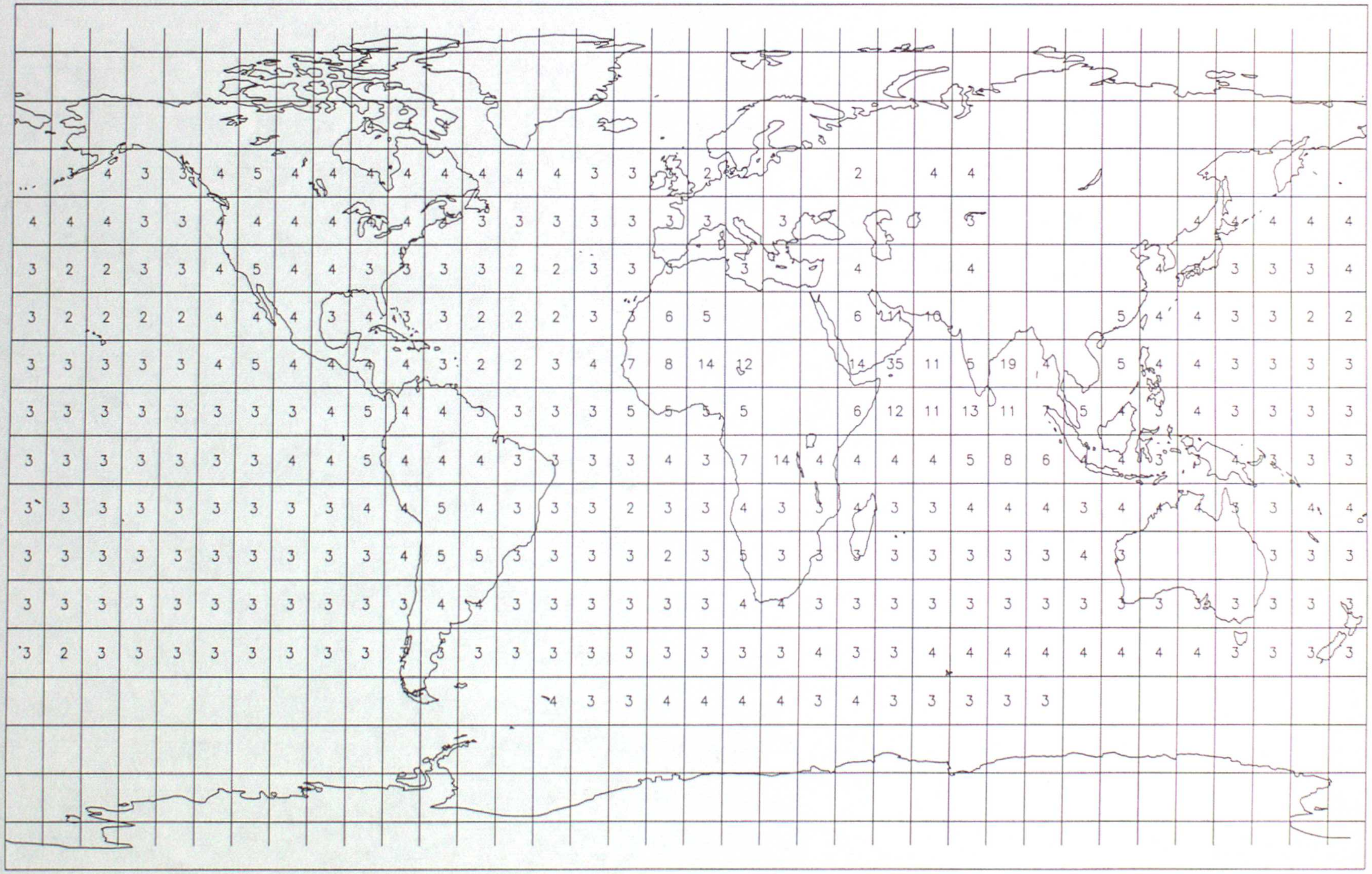
FIGURE 12


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.6 .2 .7 .9 1.1 1.6 1.0 -.8 -.1 .6 .7 .5 .5 -.5 .3 -.4 -.6 .3 1.7 .9
-.6 .1 .3 .0 .1 1.0 1.8 1.0 -.1 .5 -.2 .1 .3 .0 -.6 -.5 -.3 1.3 1.9 .7 .5 -.3 -.3 .2
-.2 .6 .6 .5 .4 .6 1.7 1.3 1.0 .7 .5 .4 .2 .0 .1 .1 .2 .7 -1.3 .9 2.1 .5 .4 .3 .7 .0
.3 .2 .1 .4 .6 2.2 2.0 1.8 1.2 1.4 .8 .1 -.2 -.1 .1 .6 1.0 1.4 2.1 .8 1.0 1.4 1.5 .5 .4 .0 .1 .1 .2
.0 .0 .1 .4 .7 1.0 1.0 1.0 .4 -.5 -.5 -1.1 -.3 .0 -.1 .3 1.1 4.2 7.6 8.3 2.9 9.1 .5 -.8 6.9 -1.6 .6 .2 -.1 .2 .3 -.1 -.1
-.4 .1 .2 .0 .4 .5 .3 -.1 .6 1.7 .9 1.0 .3 .2 -.1 .1 1.3 1.3 1.1 40.1 .1 .6 -.3 2.8 1.6 .7 .8 -.2 .1 .5 -.2 .1 -.4 -.4
-.3 -.3 -.2 -.3 -.2 .3 .6 .3 .4 2.1 1.6 .9 1.0 .4 .0 .4 .4 .6 .1 .8 5.1 .9 -.3 -.2 .5 1.0 1.8 .6 .3 .9 .1 .2 1.0 .1 -.5 -.4
.5 -.1 .2 .0 -.1 .1 .1 .0 .1 .5 1.6 .0 1.2 .4 .1 .2 .2 .1 -.1 -.1 .6 .5 .2 .1 .2 .5 .5 .2 .1 .5 1.0 -.6 .8 .8 .8 .2
.4 -.3 -.1 .4 .1 .5 .1 .4 .1 -.1 .2 -.5 -1.3 .0 .2 .2 .0 -.1 .1 .7 .5 .4 .4 .1 -.4 -.3 -.4 .3 .3 .4 .1 .2
.3 -.2 -.2 -.1 -.1 -.5 -.5 -.3 -.1 -.5 -.9 -1.2 .5 .5 .6 .2 -.1 -.1 .2 .3 .5 -.2 .1 .3 .3 .1 .1 .0 .2 .2 .1 .3 .3 .2 .5 .0
.3 .1 -.2 -.5 -.4 -.2 -.4 -.4 -.2 -.5 -1.0 .3 .0 .5 .1 -.2 .0 .2 .2 .5 .2 .3 .2 .6 .8 -.1 .6 .6 -.3 -.6 -.2 -.3 .1 .1 .1 -.1
-1.2 -.6 -.1 -.2 -.2 .1 .6 .2 .1 .2 -.2 .0 .2 -.1

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


3 4 3 3 4 5 4 4 4 4 4 4 4 4 3 3 2 2 2 4 4
4 4 4 3 3 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 3 4 4 4 4 4
3 2 2 3 3 4 5 4 4 3 3 3 3 2 2 3 3 3 3 4 4 4 3 3 3 4
3 2 2 2 2 4 4 4 3 4 3 3 2 2 2 3 3 6 5 6 11 10 5 4 4 3 3 2 2
3 3 3 3 3 4 5 4 4 4 4 3 2 2 3 4 7 8 14 12 14 35 11 5 19 4 5 4 4 3 3 3 3
3 3 3 3 3 3 3 3 4 5 4 4 3 3 3 3 5 5 5 5 6 12 11 13 11 7 5 4 3 4 3 3 3 3
3 3 3 3 3 3 3 4 4 5 4 4 4 3 3 3 3 4 3 7 14 4 4 4 4 5 8 6 4 4 3 3 4 3 3 3
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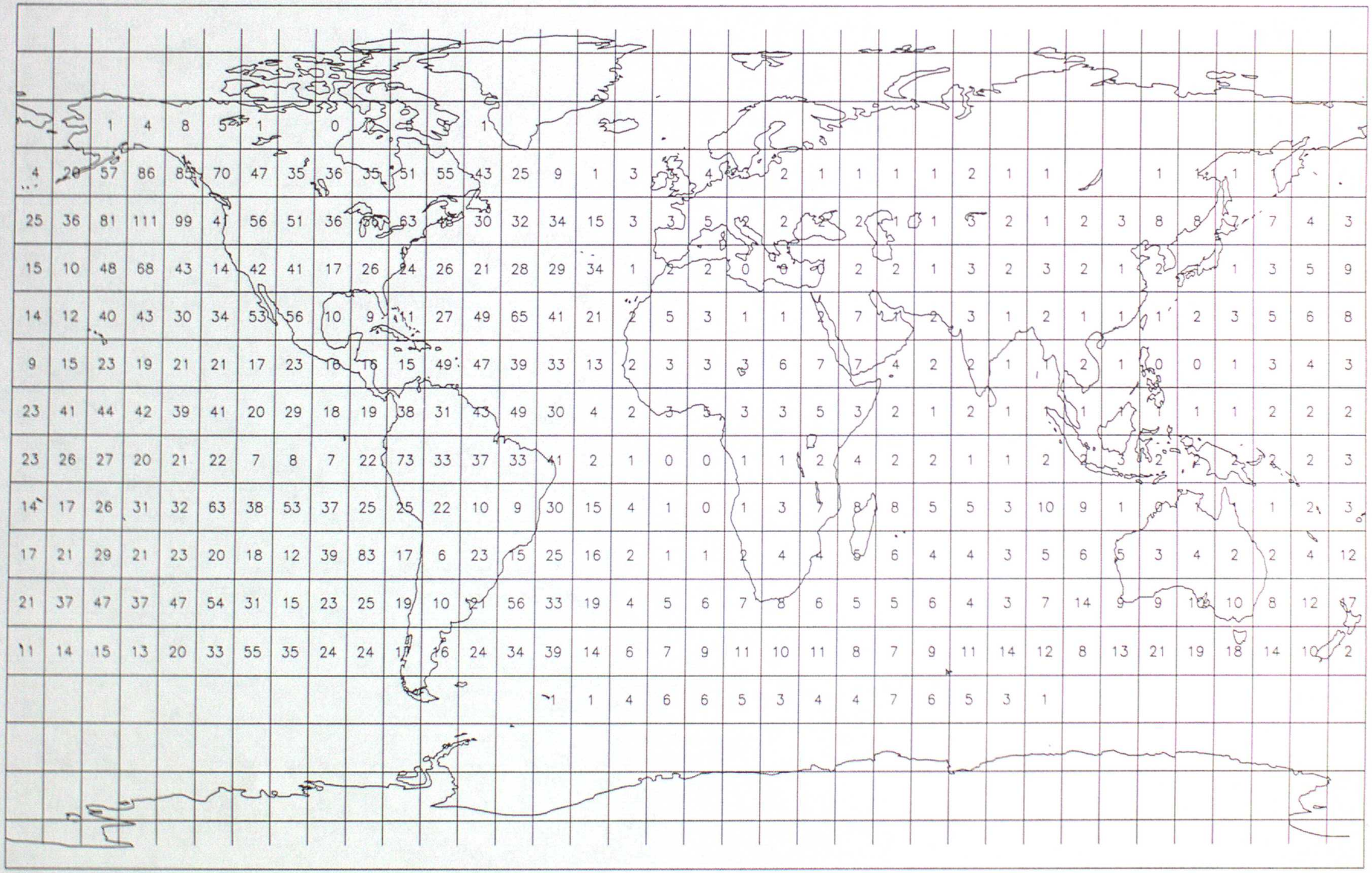
4 3 3 4 4 4 4 3 4 3 3 3 3 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JULY 2000

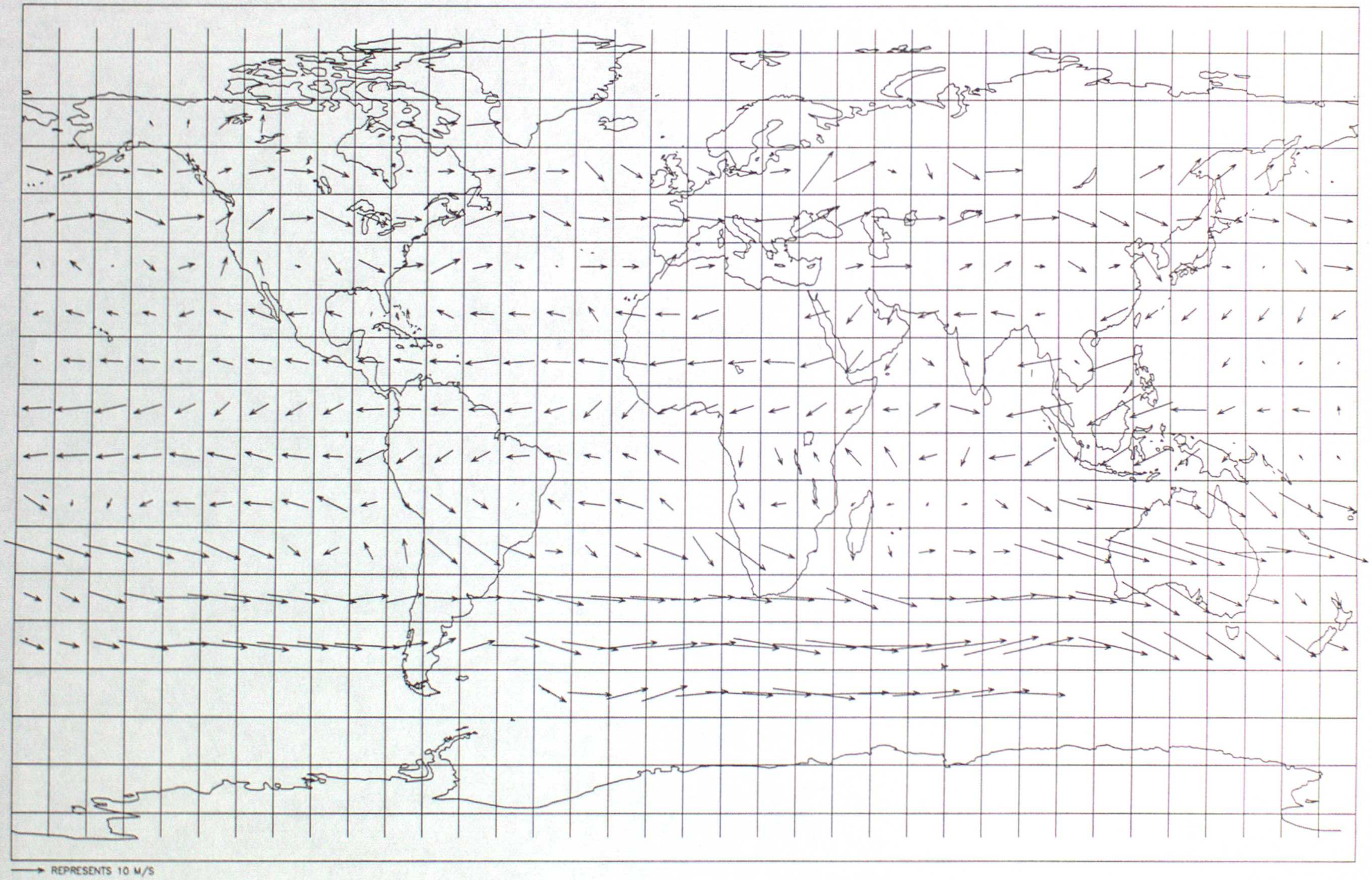
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 6420



		1	4	8	5	1		0		3		1																							
4	20	57	86	85	70	47	35	36	35	51	55	43	25	9	1	3	3	4		2	1	1	1	1	2	1	1			1	1	1	1		
25	36	81	111	99	41	56	51	36	56	63	48	30	32	34	15	3	3	5	2	2	2	2	1	1	3	2	1	2	3	8	8	7	7	4	3
15	10	48	68	43	14	42	41	17	26	24	26	21	28	29	34	1	2	2	0	0	0	2	2	1	3	2	3	2	1	2		1	3	5	9
14	12	40	43	30	34	53	56	10	9	11	27	49	65	41	21	2	5	3	1	1	2	7	1	2	3	1	2	1	1	1	2	3	5	6	8
9	15	23	19	21	21	17	23	16	16	15	49	47	39	33	13	2	3	3	3	6	7	7	4	2	2	1	1	2	1	0	0	1	3	4	3
23	41	44	42	39	41	20	29	18	19	38	31	43	49	30	4	2	3	5	3	3	5	3	2	1	2	1	1	1	1	1	1	1	2	2	2
23	26	27	20	21	22	7	8	7	22	73	33	37	33	41	2	1	0	0	1	1	2	4	2	2	1	1	2	2	3	2	2	2	2	2	3
14	17	26	31	32	63	38	53	37	25	25	22	10	9	30	15	4	1	0	1	3	7	8	8	5	5	3	10	9	1	0	1	1	1	2	3
17	21	29	21	23	20	18	12	39	83	17	6	23	15	25	16	2	1	1	2	4	4	5	6	4	4	3	5	6	5	3	4	2	2	4	12
21	37	47	37	47	54	31	15	23	25	19	10	21	56	33	19	4	5	6	7	8	6	5	5	6	4	3	7	14	9	9	10	10	8	12	17
11	14	15	13	20	33	55	35	24	24	17	16	24	34	39	14	6	7	9	11	10	11	8	7	9	11	14	12	8	13	21	19	18	14	10	2
														1	1	4	6	6	5	3	4	4	7	6	5	3	1								

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
JULY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

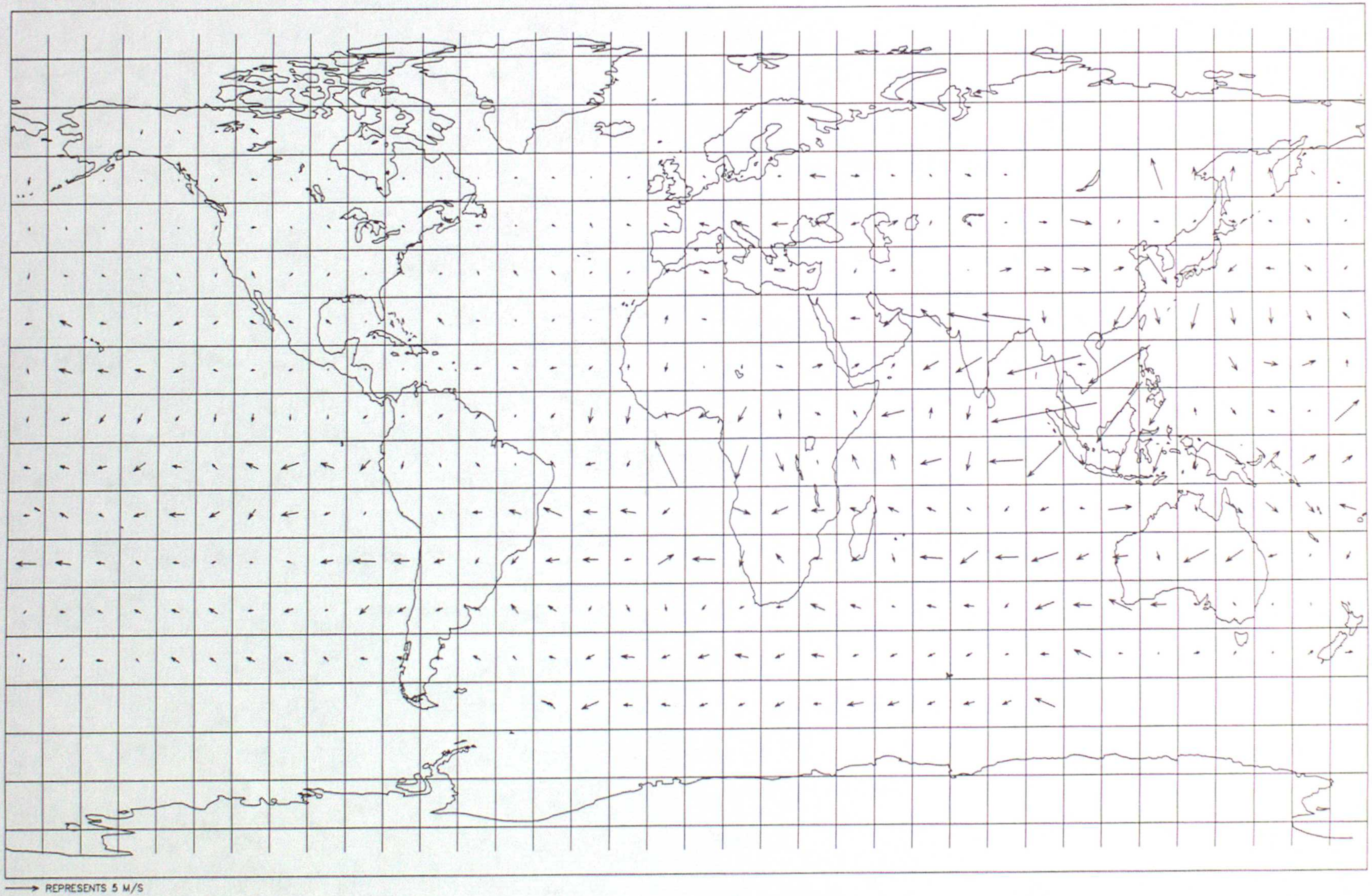
FIGURE 16


REPRESENTS 10 M/S

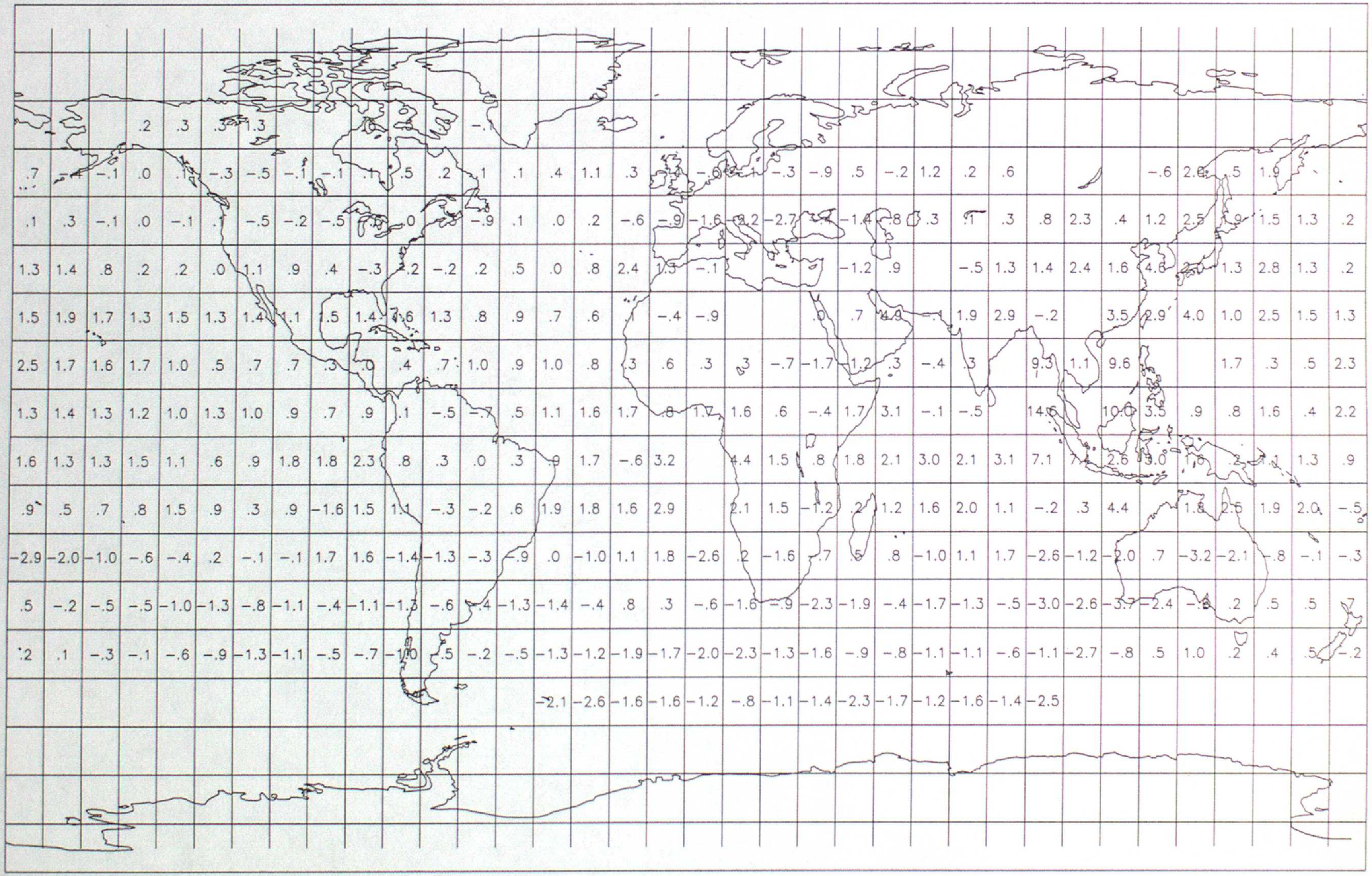
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

FIGURE 17

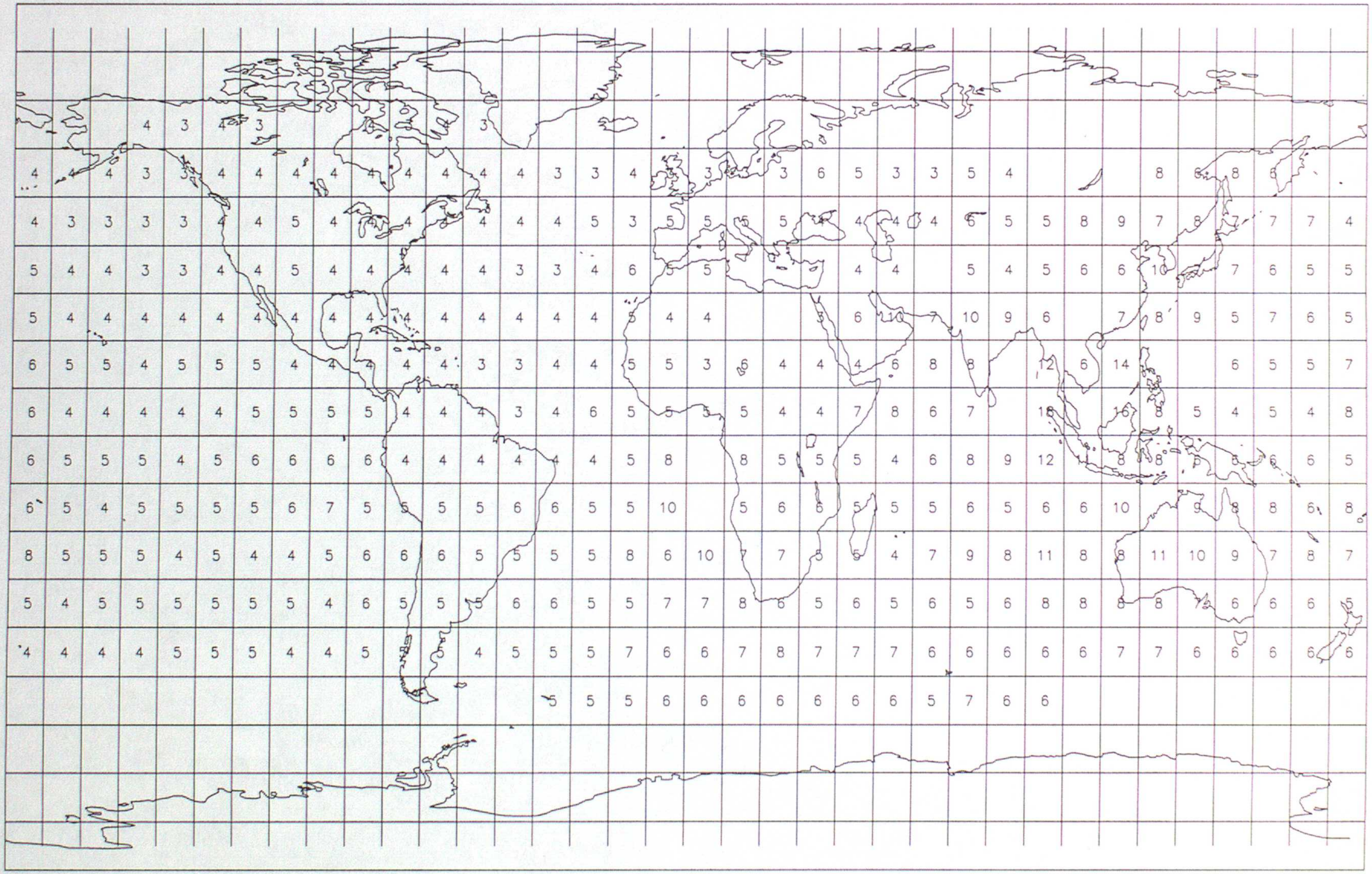
JULY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.2 .3 .3 1.3 –.1
.7 –.4 –.1 .0 .1 –.3 –.5 –.1 –.1 .1 .5 .2 .1 .1 .4 1.1 .3 –.4 –.6 –.1 –.3 –.9 .5 –.2 1.2 .2 .6 –.6 2.0 .5 1.9
.1 .3 –.1 .0 –.1 .1 –.5 –.2 –.5 .0 .0 –.3 –.9 .1 .0 .2 –.6 –.9 –1.6 –2.2 –2.7 –.4 –1.4 –.8 .3 .1 .3 .8 2.3 .4 1.2 2.5 .9 1.5 1.3 .2
1.3 1.4 .8 .2 .2 .0 1.1 .9 .4 –.3 .2 –.2 .2 .5 .0 .8 2.4 1.3 –.1 –1.2 .9 –.5 1.3 1.4 2.4 1.6 4.6 2.0 1.3 2.8 1.3 .2
1.5 1.9 1.7 1.3 1.5 1.3 1.4 1.1 1.5 1.4 1.6 1.3 .8 .9 .7 .6 .1 –.4 –.9 .0 .7 4.9 –.1 1.9 2.9 –.2 3.5 2.9 4.0 1.0 2.5 1.5 1.3
2.5 1.7 1.6 1.7 1.0 .5 .7 .7 .3 .0 .4 .7 1.0 .9 1.0 .8 .3 .6 .3 .3 –.7 –1.7 –1.2 .3 –.4 .3 9.3 1.1 9.6 1.7 .3 .5 2.3
1.3 1.4 1.3 1.2 1.0 1.3 1.0 .9 .7 .9 .1 –.5 –.7 .5 1.1 1.6 1.7 .8 1.7 1.6 .6 –.4 1.7 3.1 –.1 –.5 14.6 10.0 3.5 .9 .8 1.6 .4 2.2
1.6 1.3 1.3 1.5 1.1 .6 .9 1.8 1.8 2.3 .8 .3 .0 .3 .9 1.7 –.6 3.2 4.4 1.5 .8 1.8 2.1 3.0 2.1 3.1 7.1 7.4 2.6 3.0 1.6 .2 1.1 1.3 .9
.9 .5 .7 .8 1.5 .9 .3 .9 –1.6 1.5 1.1 –.3 –.2 .6 1.9 1.8 1.6 2.9 2.1 1.5 –1.2 .2 1.2 1.6 2.0 1.1 –.2 .3 4.4 1.8 2.5 1.9 2.0 –.5
–2.9 –2.0 –1.0 –.6 –.4 .2 –.1 –.1 1.7 1.6 –1.4 –1.3 –.3 –.9 .0 –1.0 1.1 1.8 –2.6 .2 –1.6 –.7 .5 .8 –1.0 1.1 1.7 –2.6 –1.2 –2.0 .7 –3.2 –2.1 –.8 –.1 –.3
.5 –.2 –.5 –.5 –1.0 –1.3 –.8 –1.1 –.4 –1.1 –1.3 –.6 –.4 –1.3 –1.4 –.4 .8 .3 –.6 –1.6 –.9 –2.3 –1.9 –.4 –1.7 –1.3 –.5 –3.0 –2.6 –3.7 –2.4 –.8 .2 .5 .5 .7
.2 .1 –.3 –.1 –.6 –.9 –1.3 –1.1 –.5 –.7 –1.0 .5 –.2 –.5 –1.3 –1.2 –1.9 –1.7 –2.0 –2.3 –1.3 –1.6 –.9 –.8 –1.1 –1.1 –.6 –1.1 –2.7 –.8 .5 1.0 .2 .4 .5 –.2
–2.1 –2.6 –1.6 –1.6 –1.2 –.8 –1.1 –1.4 –2.3 –1.7 –1.2 –1.6 –1.4 –2.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			4	3	4	3						3																							
4	4	4	3	3	4	4	4	4	4	4	4	4	4	3	3	4		3		3	6	5	3	3	5	4				8	6	8	6		
4	3	3	3	3	4	4	5	4	4	4	4	4	4	4	5	3	5	5	5	5	4	4	4	4	6	5	5	8	9	7	8	7	7	7	4
5	4	4	3	3	4	4	5	4	4	4	4	4	3	3	4	6	5	5				4	4		5	4	5	6	6	10		7	6	5	5
5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4			3	6	10	7	10	9	6		7	8	9	5	7	6	5
6	5	5	4	5	5	5	4	4	4	4	4	3	3	4	4	5	5	3	6	4	4	4	6	8	8		12	6	14			6	5	5	7
6	4	4	4	4	4	5	5	5	5	4	4	4	3	4	6	5	5	5	5	4	4	7	8	6	7		18		16	8	5	4	5	4	8
6	5	5	5	4	5	6	6	6	6	4	4	4	4	4	4	5	8		8	5	5	5	4	6	8	9	12	11	8	8	6	8	6	6	5
6	5	4	5	5	5	5	6	7	5	5	5	5	6	6	5	5	10		5	6	6	5	5	5	6	5	6	6	10		9	8	8	6	8
8	5	5	5	4	5	4	4	5	6	6	6	5	5	5	5	8	6	10	7	7	5	5	4	7	9	8	11	8	8	11	10	9	7	8	7
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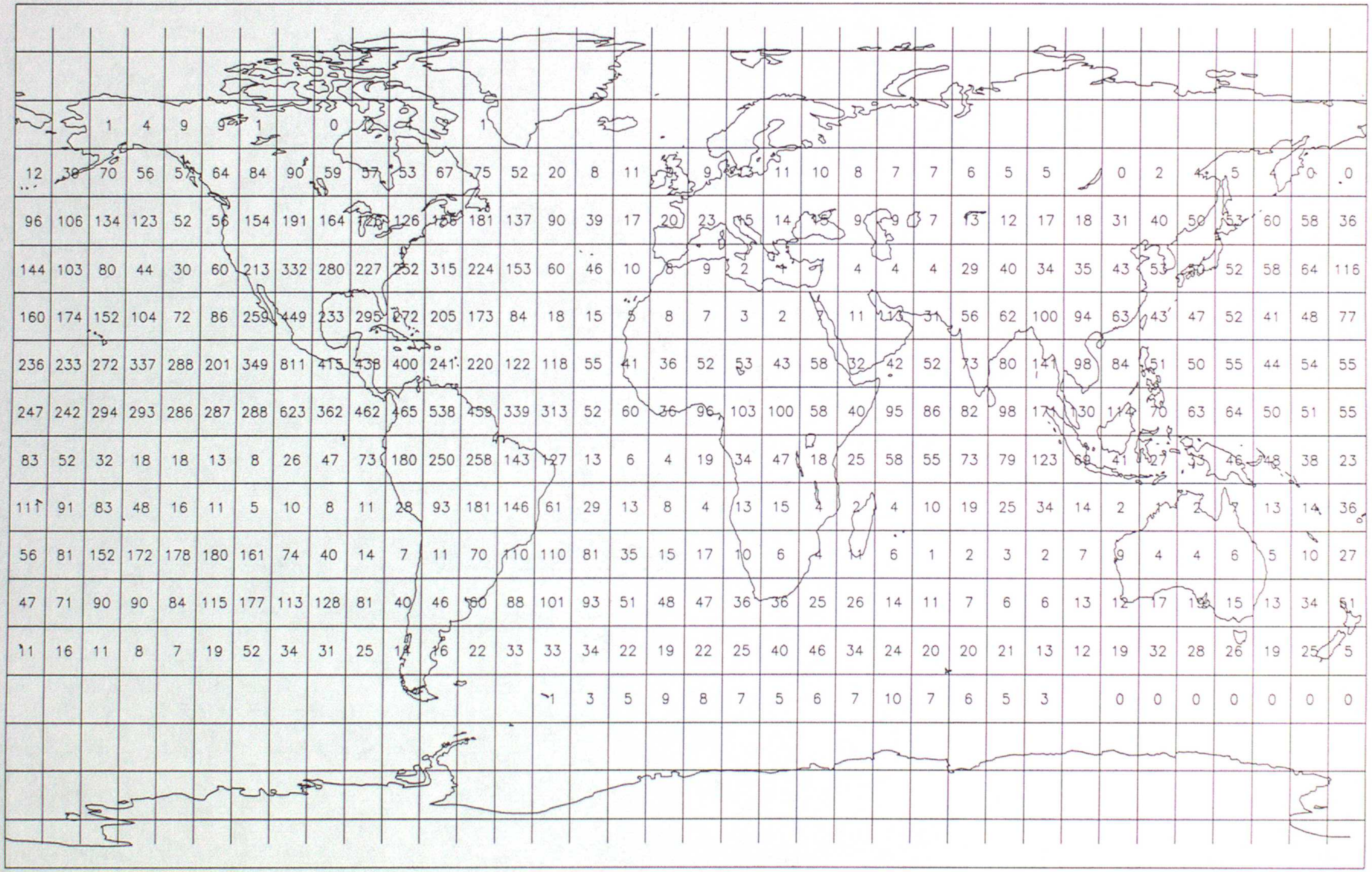
4	4	4	4	5	5	5	4	4	5	5	5	4	5	5	5	7	6	6	7	8	7	7	7	6	6	6	6	6	7	7	6	6	6	6	6
														5	5	5	6	6	6	6	6	6	6	5	7	6	6								

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JULY 2000

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 31154



		1	4	9	9	1		0				1																							
12	38	70	56	57	64	84	90	59	57	53	67	75	52	20	8	11	9	9	13	11	10	8	7	7	6	5	5		0	2	4	5	4	0	0
96	106	134	123	52	56	154	191	164	126	126	156	181	137	90	39	17	20	23	15	14	15	9	9	7	13	12	17	18	31	40	50	53	60	58	36
144	103	80	44	30	60	213	332	280	227	252	315	224	153	60	46	10	8	9	2	1	1	4	4	4	29	40	34	35	43	53	50	52	58	64	116
160	174	152	104	72	86	259	449	233	295	272	205	173	84	18	15	5	8	7	3	2	7	11	13	31	56	62	100	94	63	43	47	52	41	48	77
236	233	272	337	288	201	349	811	415	438	400	241	220	122	118	55	41	36	52	53	43	58	32	42	52	73	80	141	98	84	51	50	55	44	54	55
247	242	294	293	286	287	288	623	362	462	465	538	459	339	313	52	60	36	96	103	100	58	40	95	86	82	98	171	130	114	70	63	64	50	51	55
83	52	32	18	18	13	8	26	47	73	180	250	258	143	127	13	6	4	19	34	47	18	25	58	55	73	79	123	69	41	27	33	46	48	38	23
111	91	83	48	16	11	5	10	8	11	28	93	181	146	61	29	13	8	4	13	15	4	2	4	10	19	25	34	14	2	1	2	7	13	14	36
56	81	152	172	178	180	161	74	40	14	7	11	70	110	110	81	35	15	17	10	6	4	11	6	1	2	3	2	7	9	4	4	6	5	10	27
47	71	90	90	84	115	177	113	128	81	40	46	60	88	101	93	51	48	47	36	36	25	26	14	11	7	6	6	13	12	17	19	15	13	34	51
11	16	11	8	7	19	52	34	31	25	14	16	22	33	33	34	22	19	22	25	40	46	34	24	20	20	21	13	12	19	32	28	26	19	25	5
														1	3	5	9	8	7	5	6	7	10	7	6	5	3		0	0	0	0	0	0	0

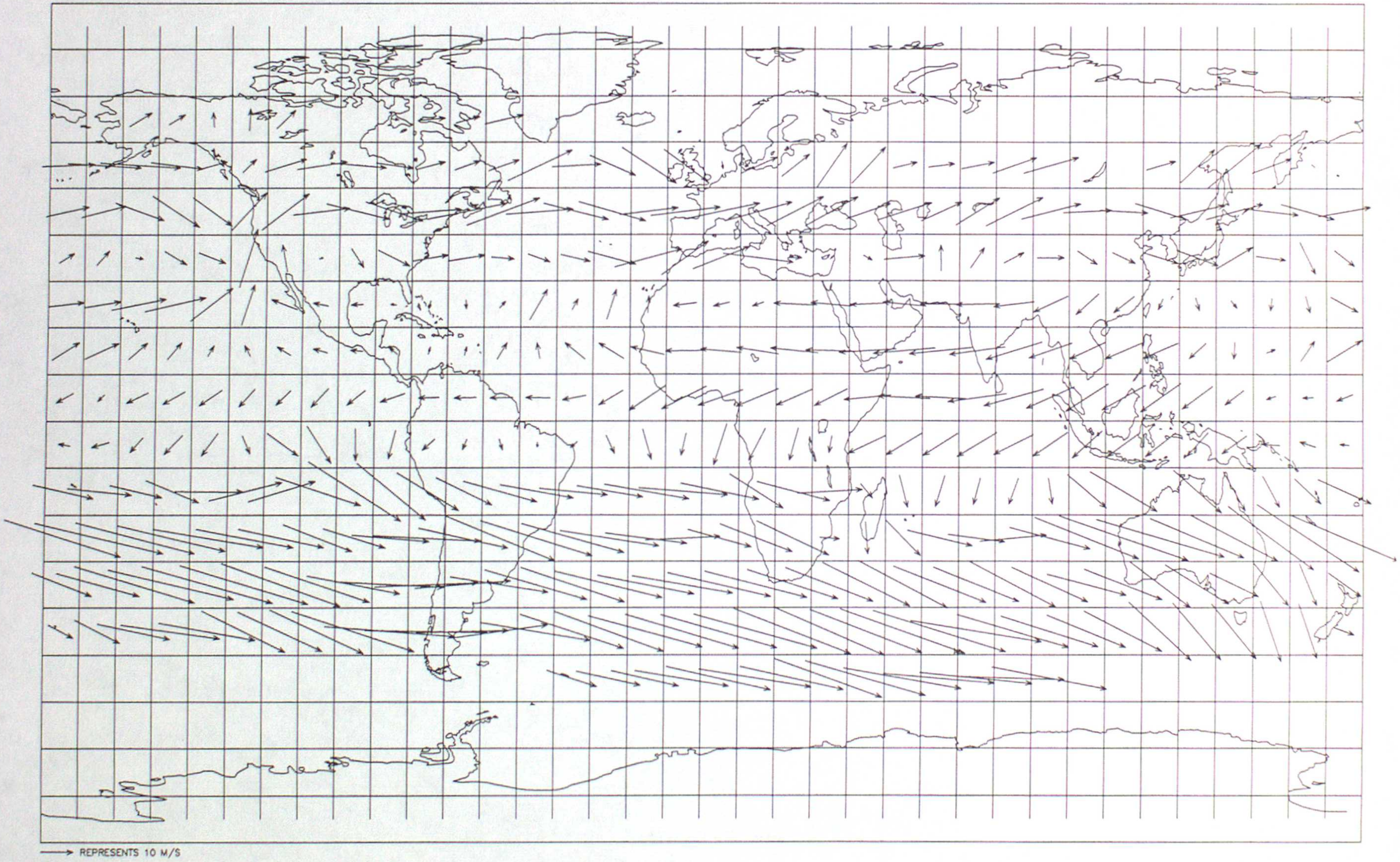
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA

FIGURE 21

JULY 2000

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

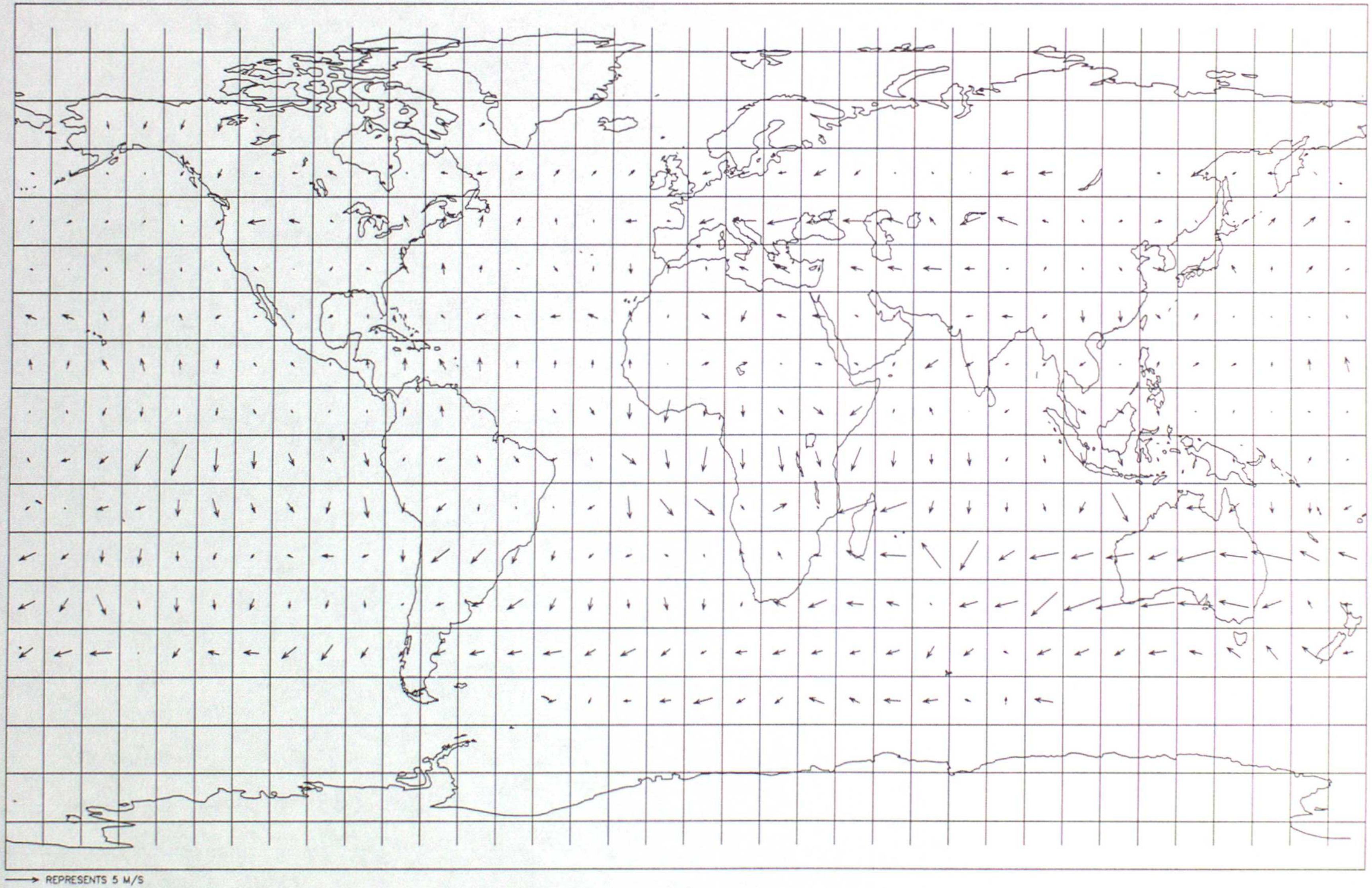
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA

FIGURE 22

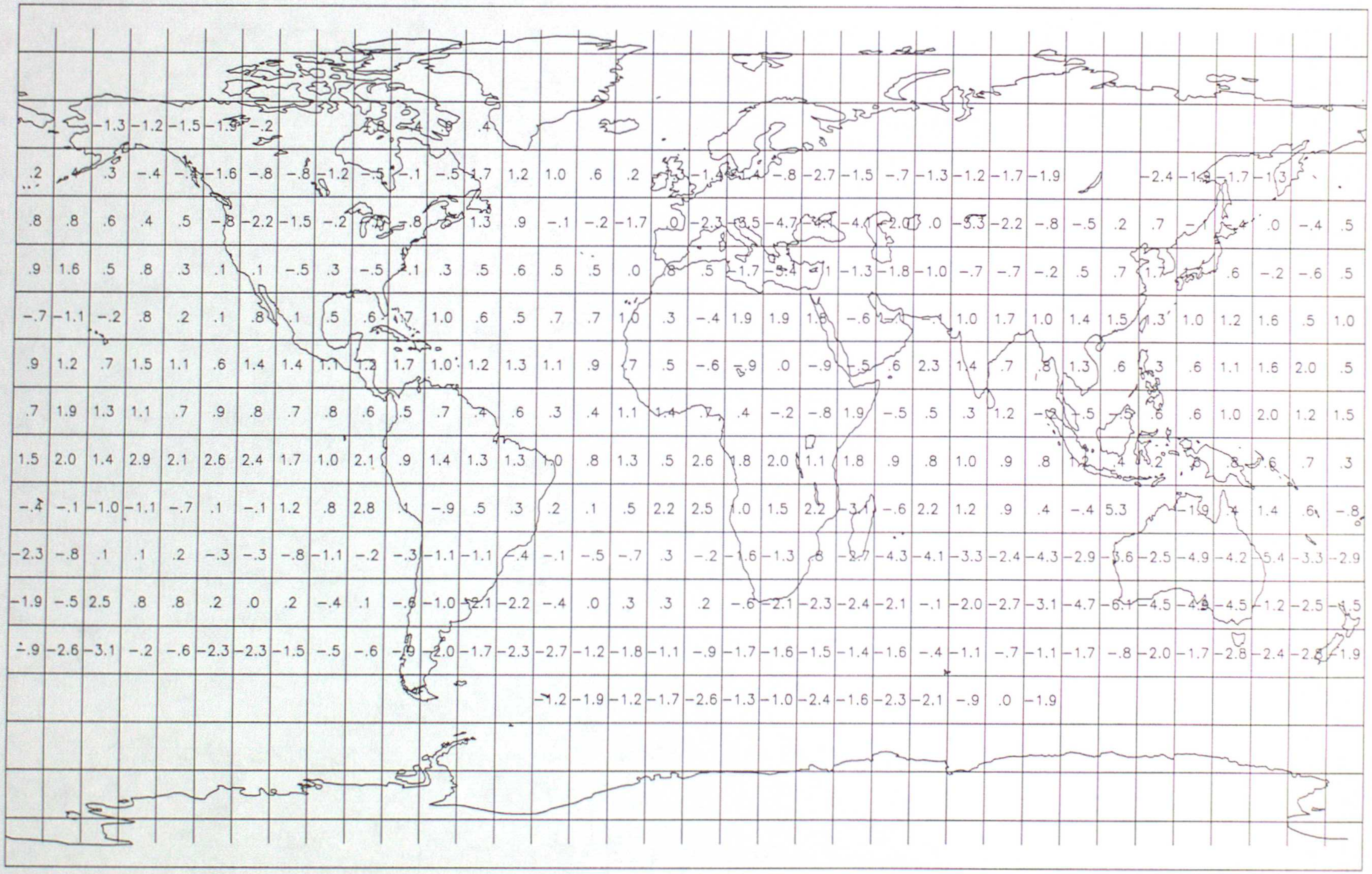
JULY 2000

ALL OBSERVATIONS

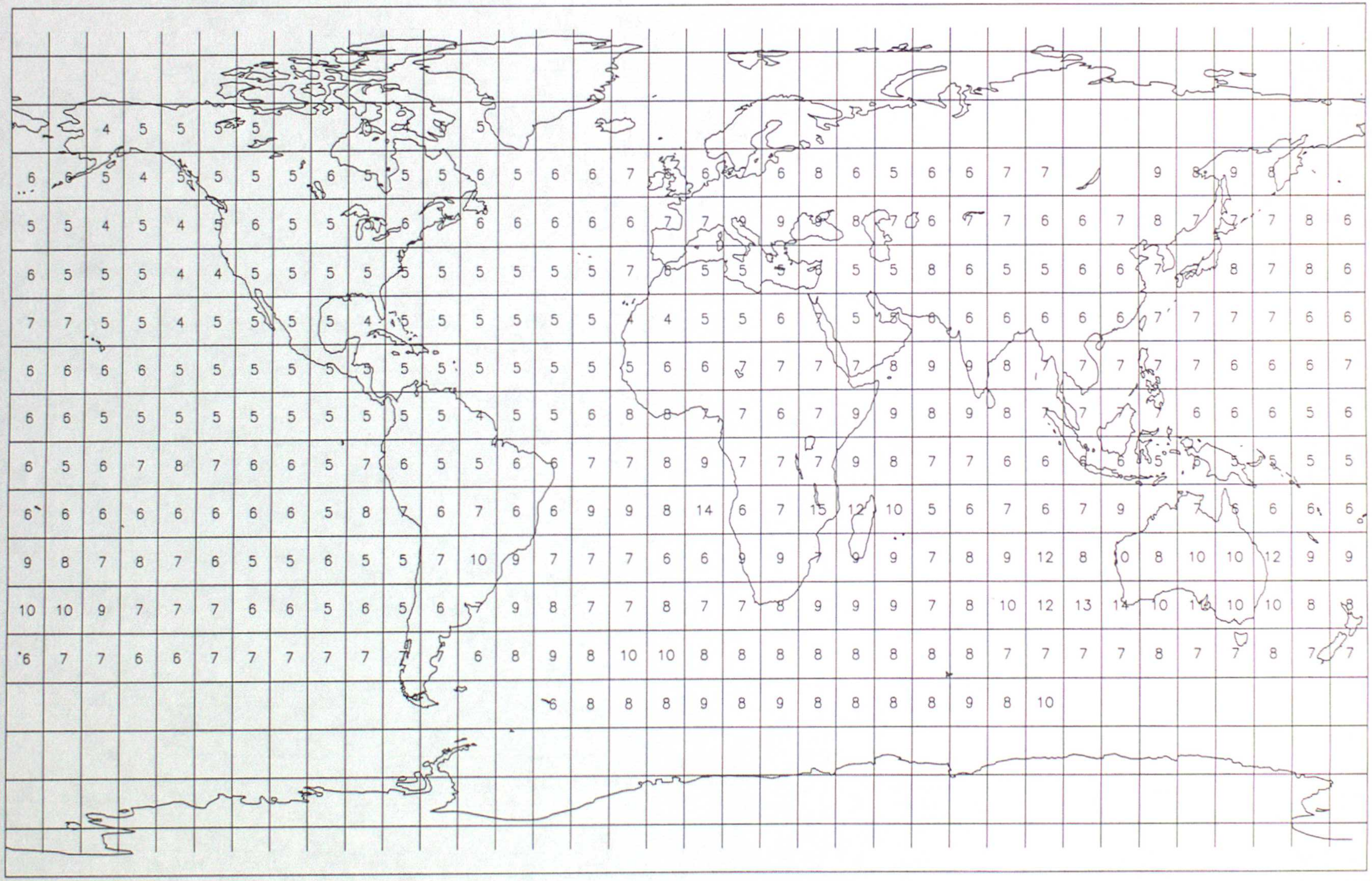
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JULY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

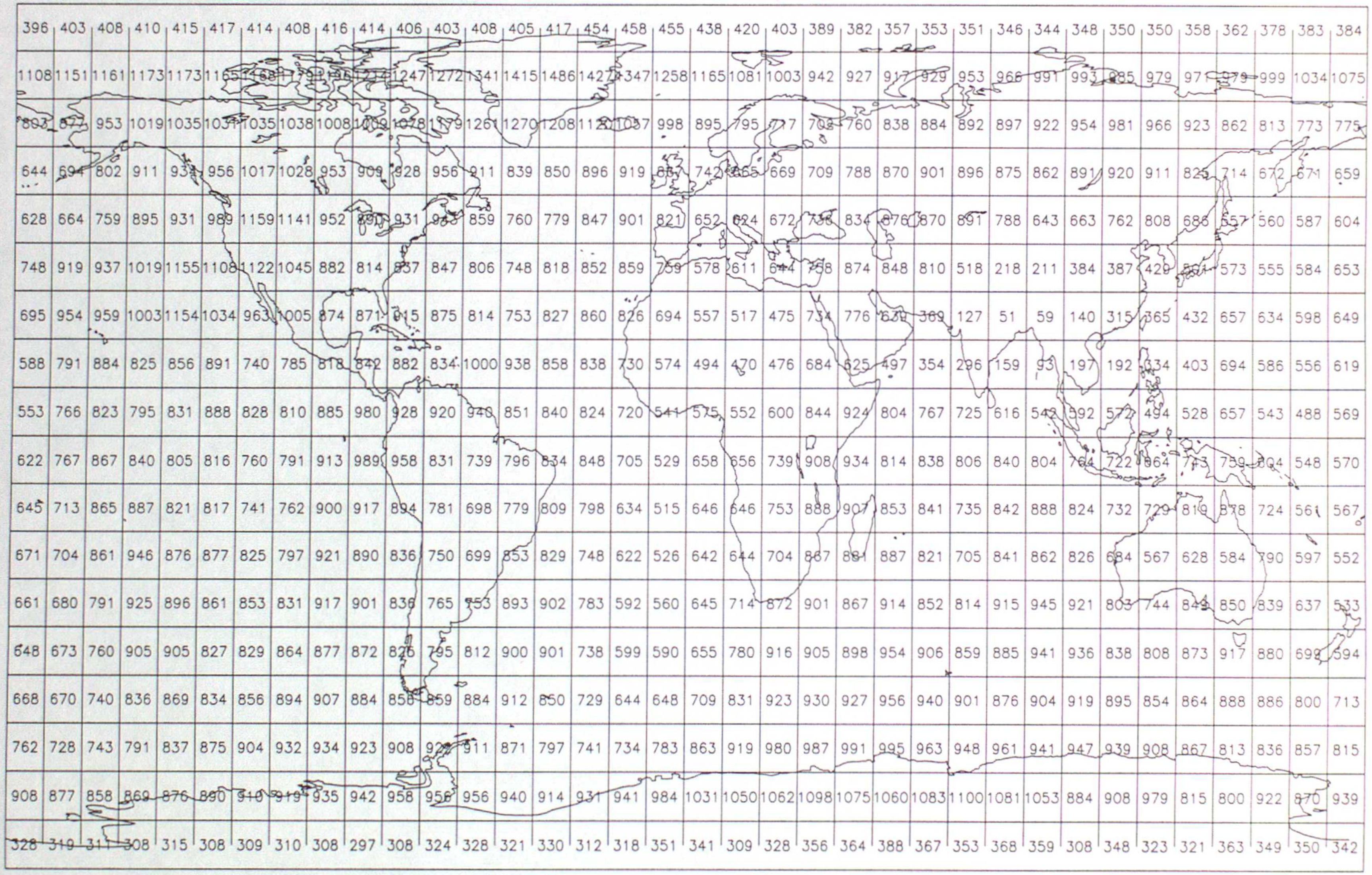
ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS

JULY 2000

NOAA-15, USING ALL OBSERVATIONS

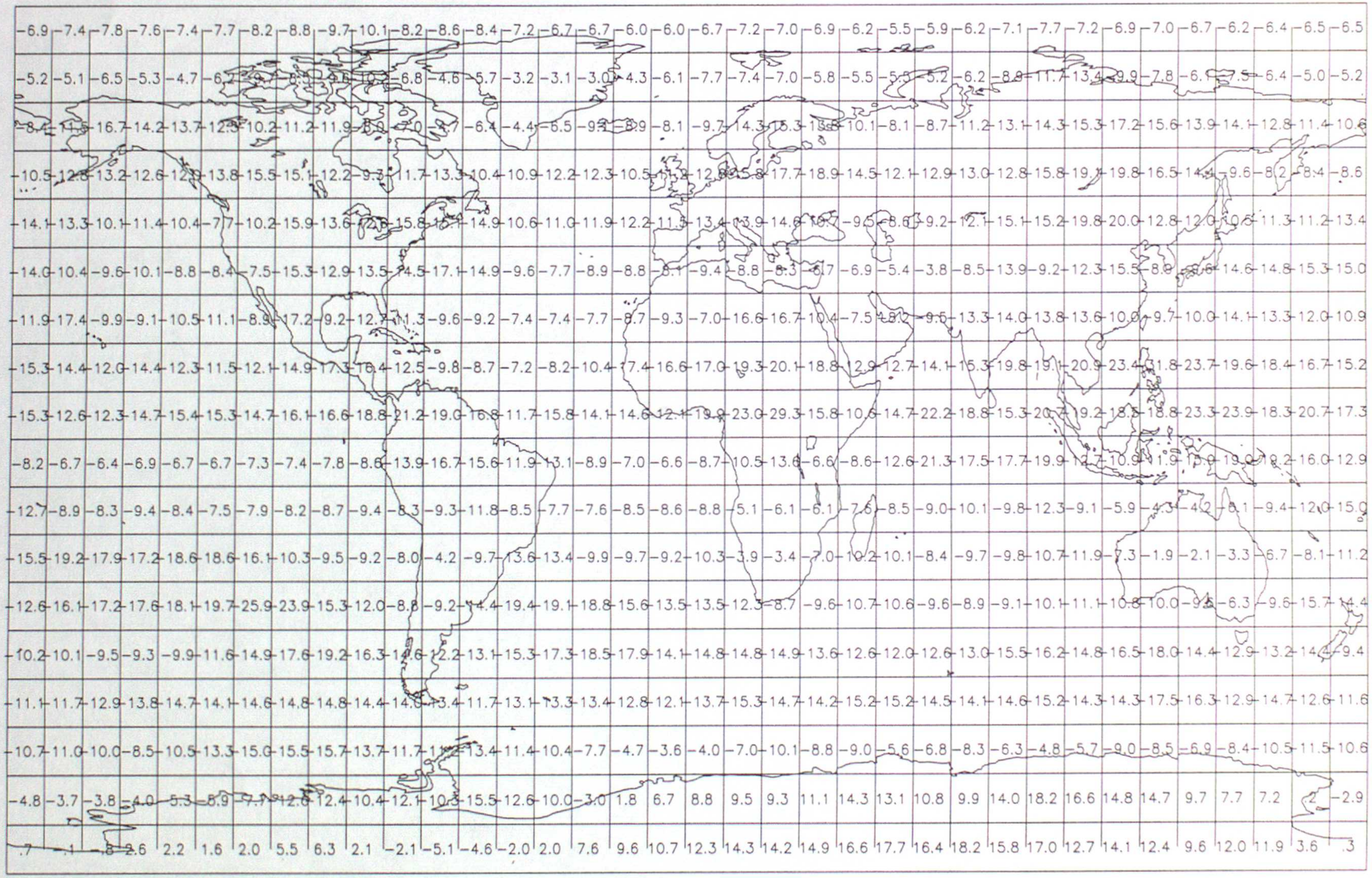
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 496596

FIGURE 25



396	403	408	410	415	417	414	408	416	414	406	403	408	405	417	454	458	455	438	420	403	389	382	357	353	351	346	344	348	350	350	358	362	378	383	384
1108	1151	1161	1173	1173	1165	1168	1179	1196	1214	1247	1272	1341	1415	1486	1427	1347	1258	1165	1081	1003	942	927	917	929	953	966	991	993	985	979	971	979	999	1034	1075
893	877	953	1019	1035	1031	1035	1038	1008	1009	1078	1179	1261	1270	1208	1120	1037	998	895	795	777	703	760	838	884	892	897	922	954	981	966	923	862	813	773	775
644	694	802	911	934	956	1017	1028	953	909	928	956	911	839	850	896	919	887	742	865	669	709	788	870	901	896	875	862	891	920	911	825	714	672	671	659
628	664	759	895	931	989	1159	1141	952	890	931	983	859	760	779	847	901	821	652	624	672	736	834	876	870	891	788	643	663	762	808	686	657	560	587	604
748	919	937	1019	1155	1108	1122	1045	882	814	837	847	806	748	818	852	859	759	578	611	644	758	874	848	810	518	218	211	384	387	429	591	573	555	584	653
695	954	959	1003	1154	1034	963	1005	874	871	915	875	814	753	827	860	826	694	557	517	475	734	776	639	369	127	51	59	140	315	365	432	657	634	598	649
588	791	884	825	856	891	740	785	818	842	882	834	1000	938	858	838	730	574	494	470	476	684	625	497	354	296	159	93	197	192	334	403	694	586	556	619
553	766	823	795	831	888	828	810	885	980	928	920	940	851	840	824	720	541	575	552	600	844	924	804	767	725	616	542	592	572	494	528	657	543	488	569
622	767	867	840	805	816	760	791	913	989	958	831	739	796	834	848	705	529	658	656	739	908	934	814	838	806	840	804	764	722	864	743	759	804	548	570
645	713	865	887	821	817	741	762	900	917	894	781	698	779	809	798	634	515	646	646	753	888	907	853	841	735	842	888	824	732	729	819	878	724	561	567
671	704	861	946	876	877	825	797	921	890	836	750	699	853	829	748	622	526	642	644	704	867	881	887	821	705	841	862	826	684	567	628	584	790	597	552
661	680	791	925	896	861	853	831	917	901	836	765	753	893	902	783	592	560	645	714	872	901	867	914	852	814	915	945	921	803	744	849	850	839	637	533
648	673	760	905	905	827	829	864	877	872	826	795	812	900	901	738	599	590	655	780	916	905	898	954	906	859	885	941	936	838	808	873	917	880	698	594
668	670	740	836	869	834	856	894	907	884	858	859	884	912	850	729	644	648	709	831	923	930	927	956	940	901	876	904	919	895	854	864	888	886	800	713
762	728	743	791	837	875	904	932	934	923	908	929	911	871	797	741	734	783	863	919	980	987	991	995	963	948	961	941	947	939	908	867	813	836	857	815
908	877	858	869	876	890	910	919	935	942	958	956	956	940	914	931	941	984	1031	1050	1062	1098	1075	1060	1083	1100	1081	1053	884	908	979	815	800	922	870	939
328	319	311	308	315	308	309	310	308	297	308	324	328	321	330	312	318	351	341	309	328	356	364	388	367	353	368	359	308	348	323	321	363	349	350	342

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)   FIGURE 26
JULY 2000   : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS

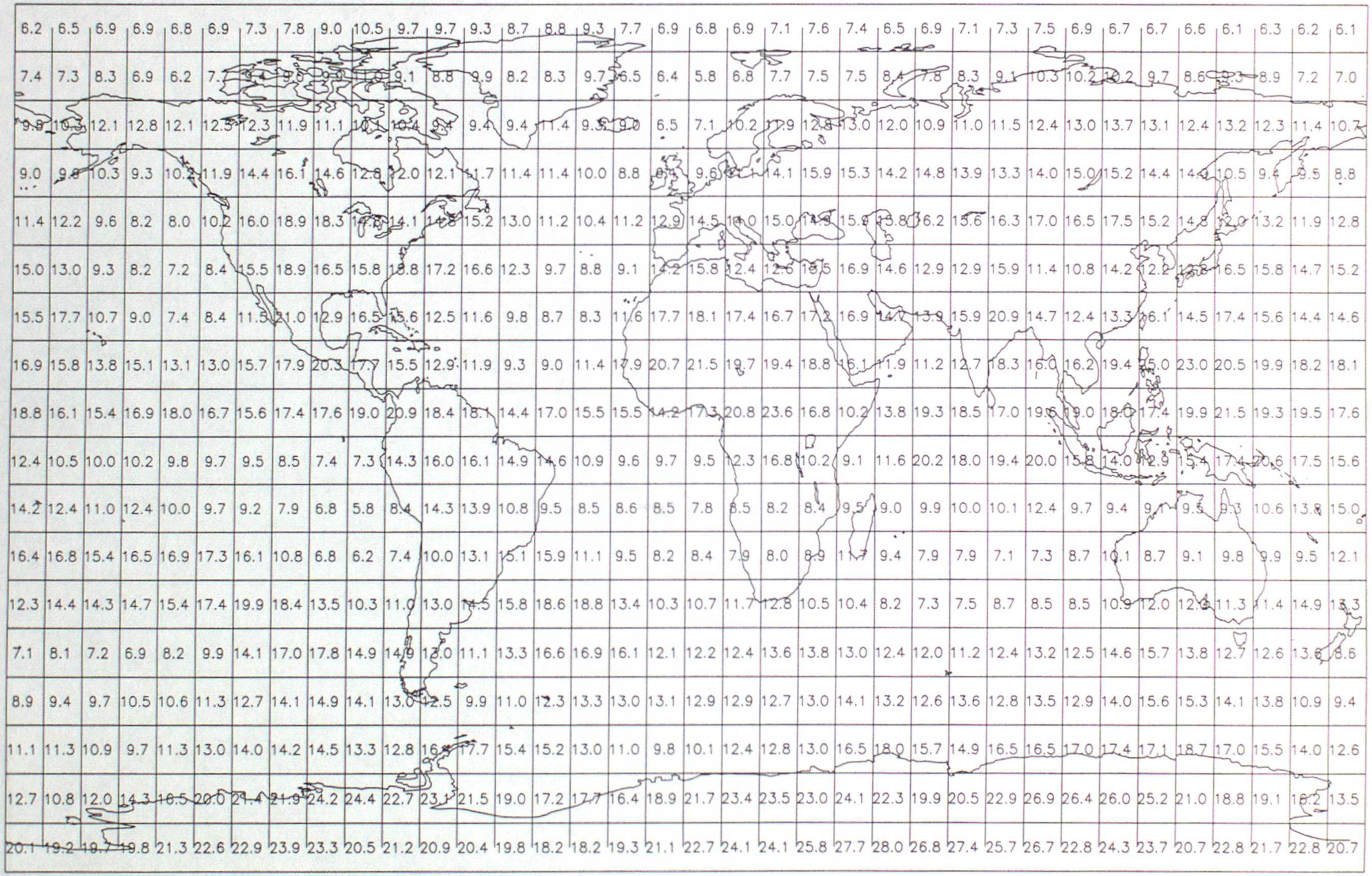


-6.9	-7.4	-7.8	-7.6	-7.4	-7.7	-8.2	-8.8	-9.7	-10.1	-8.2	-8.6	-8.4	-7.2	-6.7	-6.7	-6.0	-6.0	-6.7	-7.2	-7.0	-6.9	-6.2	-5.5	-5.9	-6.2	-7.1	-7.7	-7.2	-6.9	-7.0	-6.7	-6.2	-6.4	-6.5	-6.5
-5.2	-5.1	-6.5	-5.3	-4.7	-6.2	-9.7	-8.5	-4.6	-10.2	-6.8	-4.6	-5.7	-3.2	-3.1	-3.0	-4.3	-6.1	-7.7	-7.4	-7.0	-5.8	-5.5	-5.5	-5.2	-6.2	-8.8	-11.7	-13.4	-9.9	-7.8	-6.1	-7.5	-6.4	-5.0	-5.2
-8.4	-11.5	-16.7	-14.2	-13.7	-12.3	-10.2	-11.2	-11.9	-8.9	-7.0	-8.7	-6.4	-4.4	-6.5	-9.3	-8.9	-8.1	-9.7	-14.3	-15.3	-13.8	-10.1	-8.1	-8.7	-11.2	-13.1	-14.3	-15.3	-17.2	-15.6	-13.9	-14.1	-12.8	-11.4	-10.6
-10.5	-12.8	-13.2	-12.6	-12.9	-13.8	-15.5	-15.1	-12.2	-9.3	-11.7	-13.3	-10.4	-10.9	-12.2	-12.3	-10.5	-11.2	-12.8	-15.8	-17.7	-18.9	-14.5	-12.1	-12.9	-13.0	-12.8	-15.8	-19.1	-19.8	-16.5	-14.4	-9.6	-8.2	-8.4	-8.6
-14.1	-13.3	-10.1	-11.4	-10.4	-7.7	-10.2	-15.9	-13.6	-12.6	-15.8	-15.1	-14.9	-10.6	-11.0	-11.9	-12.2	-11.5	-13.4	-13.9	-14.6	-10.7	-9.5	-8.6	-9.2	-12.1	-15.1	-15.2	-19.8	-20.0	-12.8	-12.0	-10.5	-11.3	-11.2	-13.4
-14.0	-10.4	-9.6	-10.1	-8.8	-8.4	-7.5	-15.3	-12.9	-13.5	-14.5	-17.1	-14.9	-9.6	-7.7	-8.9	-8.8	-8.1	-9.4	-8.8	-8.3	-6.7	-6.9	-5.4	-3.8	-8.5	-13.9	-9.2	-12.3	-15.5	-8.8	-8.6	-14.6	-14.8	-15.3	-15.0
-11.9	-17.4	-9.9	-9.1	-10.5	-11.1	-8.9	-17.2	-9.2	-12.7	-11.3	-9.6	-9.2	-7.4	-7.4	-7.7	-8.7	-9.3	-7.0	-16.6	-16.7	-10.4	-7.5	-8.2	-9.5	-13.3	-14.0	-13.8	-13.6	-10.0	-9.7	-10.0	-14.1	-13.3	-12.0	-10.9
-15.3	-14.4	-12.0	-14.4	-12.3	-11.5	-12.1	-14.9	-17.3	-16.4	-12.5	-9.8	-8.7	-7.2	-8.2	-10.4	-17.4	-16.6	-17.0	-19.3	-20.1	-18.8	-12.9	-12.7	-14.1	-15.3	-19.8	-19.1	-20.9	-23.4	-31.8	-23.7	-19.6	-18.4	-16.7	-15.2
-15.3	-12.6	-12.3	-14.7	-15.4	-15.3	-14.7	-16.1	-16.6	-18.8	-21.2	-19.0	-16.8	-11.7	-15.8	-14.1	-14.6	-12.1	-19.9	-23.0	-29.3	-15.8	-10.6	-14.7	-22.2	-18.8	-15.3	-20.7	-19.2	-18.5	-18.8	-23.3	-23.9	-18.3	-20.7	-17.3
-8.2	-6.7	-6.4	-6.9	-6.7	-6.7	-7.3	-7.4	-7.8	-8.6	-13.9	-16.7	-15.6	-11.9	-13.1	-8.9	-7.0	-6.6	-8.7	-10.5	-13.6	-6.6	-8.6	-12.6	-21.3	-17.5	-17.7	-19.9	-12.7	-10.9	-11.9	-15.9	-19.0	-18.2	-16.0	-12.9
-12.7	-8.9	-8.3	-9.4	-8.4	-7.5	-7.9	-8.2	-8.7	-9.4	-8.3	-9.3	-11.8	-8.5	-7.7	-7.6	-8.5	-8.6	-8.8	-5.1	-6.1	-6.1	-7.6	-8.5	-9.0	-10.1	-9.8	-12.3	-9.1	-5.9	-4.3	-4.2	-8.1	-9.4	-12.0	-15.0
-15.5	-19.2	-17.9	-17.2	-18.6	-18.6	-16.1	-10.3	-9.5	-9.2	-8.0	-4.2	-9.7	-13.6	-13.4	-9.9	-9.7	-9.2	-10.3	-3.9	-3.4	-7.0	-10.2	-10.1	-8.4	-9.7	-9.8	-10.7	-11.9	-7.3	-1.9	-2.1	-3.3	-6.7	-8.1	-11.2
-12.6	-16.1	-17.2	-17.6	-18.1	-19.7	-25.9	-23.9	-15.3	-12.0	-8.8	-9.2	-14.4	-19.4	-19.1	-18.8	-15.6	-13.5	-13.5	-12.3	-8.7	-9.6	-10.7	-10.6	-9.6	-8.9	-9.1	-10.1	-11.1	-10.8	-10.0	-9.5	-6.3	-9.6	-15.7	-14.4
-10.2	-10.1	-9.5	-9.3	-9.9	-11.6	-14.9	-17.6	-19.2	-16.3	-14.6	-12.2	-13.1	-15.3	-17.3	-18.5	-17.9	-14.1	-14.8	-14.8	-14.9	-13.6	-12.6	-12.0	-12.6	-13.0	-15.5	-16.2	-14.8	-16.5	-18.0	-14.4	-12.9	-13.2	-14.4	-9.4
-11.1	-11.7	-12.9	-13.8	-14.7	-14.1	-14.6	-14.8	-14.8	-14.4	-14.0	-13.4	-11.7	-13.1	-13.3	-13.4	-12.8	-12.1	-13.7	-15.3	-14.7	-14.2	-15.2	-15.2	-14.5	-14.1	-14.6	-15.2	-14.3	-14.3	-17.5	-16.3	-12.9	-14.7	-12.6	-11.6
-10.7	-11.0	-10.0	-8.5	-10.5	-13.3	-15.0	-15.5	-15.7	-13.7	-11.7	-11.2	-13.4	-11.4	-10.4	-7.7	-4.7	-3.6	-4.0	-7.0	-10.1	-8.8	-9.0	-5.6	-6.8	-8.3	-6.3	-4.8	-5.7	-9.0	-8.5	-6.9	-8.4	-10.5	-11.5	-10.6
-4.8	-3.7	-3.8	-4.0	-5.3	-5.9	-7.7	-12.6	-12.4	-10.4	-12.1	-10.3	-15.5	-12.6	-10.0	-3.0	1.8	6.7	8.8	9.5	9.3	11.1	14.3	13.1	10.8	9.9	14.0	18.2	16.6	14.8	14.7	9.7	7.7	7.2	.2	-2.9
.7	-.1	-.8	2.6	2.2	1.6	2.0	5.5	6.3	2.1	-2.1	-5.1	-4.6	-2.0	2.0	7.6	9.6	10.7	12.3	14.3	14.2	14.9	16.6	17.7	16.4	18.2	15.8	17.0	12.7	14.1	12.4	9.6	12.0	11.9	3.6	.3

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

FIGURE 27

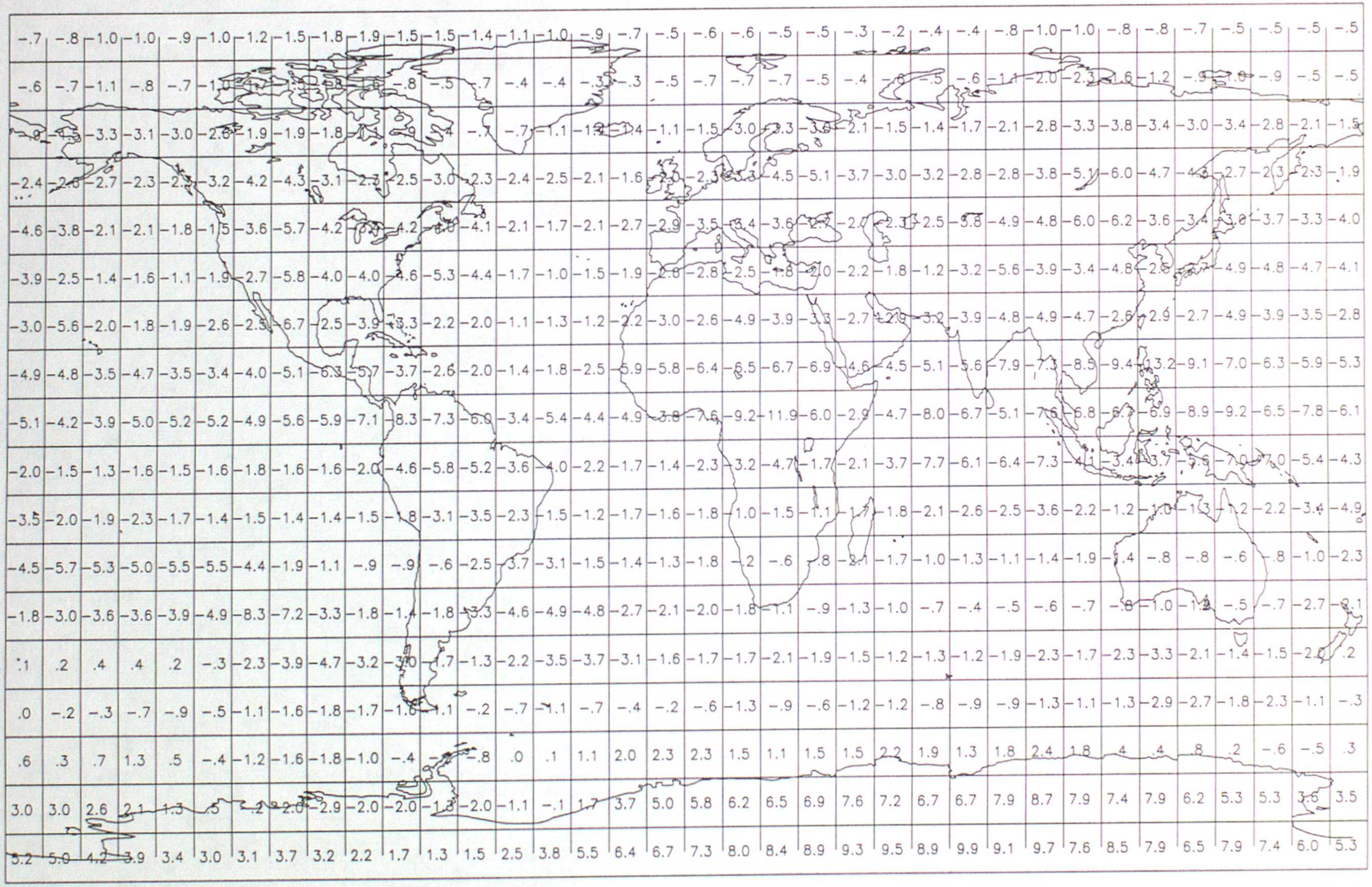
JULY 2000 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS



6.2	6.5	6.9	6.9	6.8	6.9	7.3	7.8	9.0	10.5	9.7	9.7	9.3	8.7	8.8	9.3	7.7	6.9	6.8	6.9	7.1	7.6	7.4	6.5	6.9	7.1	7.3	7.5	6.9	6.7	6.7	6.6	6.1	6.3	6.2	6.1
7.4	7.3	8.3	6.9	6.2	7.7	9.4	9.0	[illegible]	11.0	9.1	8.8	9.9	8.2	8.3	9.7	6.5	6.4	5.8	6.8	7.7	7.5	7.5	8.4	7.8	8.3	9.1	10.3	10.2	10.2	9.7	8.6	9.3	8.9	7.2	7.0
9.8	10.3	12.1	12.8	12.1	12.5	12.3	11.9	11.1	10.1	10.4	9.4	9.4	9.4	11.4	9.5	9.0	6.5	7.1	10.2	11.9	12.8	13.0	12.0	10.9	11.0	11.5	12.4	13.0	13.7	13.1	12.4	13.2	12.3	11.4	10.7
9.0	9.8	10.3	9.3	10.2	11.9	14.4	16.1	14.6	12.8	12.0	12.1	11.7	11.4	11.4	10.0	8.8	[illegible]	9.6	[illegible]	14.1	15.9	15.3	14.2	14.8	13.9	13.3	14.0	15.0	15.2	14.4	14.0	10.5	9.4	9.5	8.8
11.4	12.2	9.6	8.2	8.0	10.2	16.0	18.9	18.3	[illegible]	14.1	14.8	15.2	13.0	11.2	10.4	11.2	12.9	14.5	14.0	15.0	14.9	15.9	15.8	16.2	15.6	16.3	17.0	16.5	17.5	15.2	14.8	12.0	13.2	11.9	12.8
15.0	13.0	9.3	8.2	7.2	8.4	15.5	18.9	16.5	15.8	18.8	17.2	16.6	12.3	9.7	8.8	9.1	14.2	15.8	12.4	12.6	18.5	16.9	14.6	12.9	12.9	15.9	11.4	10.8	14.2	12.2	12.8	16.5	15.8	14.7	15.2
15.5	17.7	10.7	9.0	7.4	8.4	11.5	21.0	12.9	16.5	15.6	12.5	11.6	9.8	8.7	8.3	11.6	17.7	18.1	17.4	16.7	17.2	16.9	14.7	13.9	15.9	20.9	14.7	12.4	13.3	16.1	14.5	17.4	15.6	14.4	14.6
16.9	15.8	13.8	15.1	13.1	13.0	15.7	17.9	20.3	17.7	15.5	12.9	11.9	9.3	9.0	11.4	17.9	20.7	21.5	19.7	19.4	18.8	16.1	11.9	11.2	12.7	18.3	16.0	16.2	19.4	25.0	23.0	20.5	19.9	18.2	18.1
18.8	16.1	15.4	16.9	18.0	16.7	15.6	17.4	17.6	19.0	20.9	18.4	18.1	14.4	17.0	15.5	15.5	14.2	17.3	20.8	23.6	16.8	10.2	13.8	19.3	18.5	17.0	19.6	19.0	18.0	17.4	19.9	21.5	19.3	19.5	17.6
12.4	10.5	10.0	10.2	9.8	9.7	9.5	8.5	7.4	7.3	14.3	16.0	16.1	14.9	14.6	10.9	9.6	9.7	9.5	12.3	16.8	10.2	9.1	11.6	20.2	18.0	19.4	20.0	15.8	14.0	12.9	15.4	17.4	20.6	17.5	15.6
14.2	12.4	11.0	12.4	10.0	9.7	9.2	7.9	6.8	5.8	8.4	14.3	13.9	10.8	9.5	8.5	8.6	8.5	7.8	8.5	8.2	8.4	9.5	9.0	9.9	10.0	10.1	12.4	9.7	9.4	9.1	9.5	9.3	10.6	13.8	15.0
16.4	16.8	15.4	16.5	16.9	17.3	16.1	10.8	6.8	6.2	7.4	10.0	13.1	15.1	15.9	11.1	9.5	8.2	8.4	7.9	8.0	8.9	11.7	9.4	7.9	7.9	7.1	7.3	8.7	10.1	8.7	9.1	9.8	9.9	9.5	12.1
12.3	14.4	14.3	14.7	15.4	17.4	19.9	18.4	13.5	10.3	11.0	13.0	14.5	15.8	18.6	18.8	13.4	10.3	10.7	11.7	12.8	10.5	10.4	8.2	7.3	7.5	8.7	8.5	8.5	10.9	12.0	12.6	11.3	11.4	14.9	13.3
7.1	8.1	7.2	6.9	8.2	9.9	14.1	17.0	17.8	14.9	14.9	13.0	11.1	13.3	16.6	16.9	16.1	12.1	12.2	12.4	13.6	13.8	13.0	12.4	12.0	11.2	12.4	13.2	12.5	14.6	15.7	13.8	12.7	12.6	13.6	8.6
8.9	9.4	9.7	10.5	10.6	11.3	12.7	14.1	14.9	14.1	13.0	12.5	9.9	11.0	12.3	13.3	13.0	13.1	12.9	12.9	12.7	13.0	14.1	13.2	12.6	13.6	12.8	13.5	12.9	14.0	15.6	15.3	14.1	13.8	10.9	9.4
11.1	11.3	10.9	9.7	11.3	13.0	14.0	14.2	14.5	13.3	12.8	16.4	17.7	15.4	15.2	13.0	11.0	9.8	10.1	12.4	12.8	13.0	16.5	18.0	15.7	14.9	16.5	16.5	17.0	17.4	17.1	18.7	17.0	15.5	14.0	12.6
12.7	10.8	12.0	14.3	16.5	20.0	21.4	21.9	24.2	24.4	22.7	23.1	21.5	19.0	17.2	17.7	16.4	18.9	21.7	23.4	23.5	23.0	24.1	22.3	19.9	20.5	22.9	26.9	26.4	26.0	25.2	21.0	18.8	19.1	16.2	13.5
20.1	19.2	19.7	19.8	21.3	22.6	22.9	23.9	23.3	20.5	21.2	20.9	20.4	19.8	18.2	18.2	19.3	21.1	22.7	24.1	24.1	25.8	27.7	28.0	26.8	27.4	25.7	26.7	22.8	24.3	23.7	20.7	22.8	21.7	22.8	20.7

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JULY 2000 : HIRS15 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

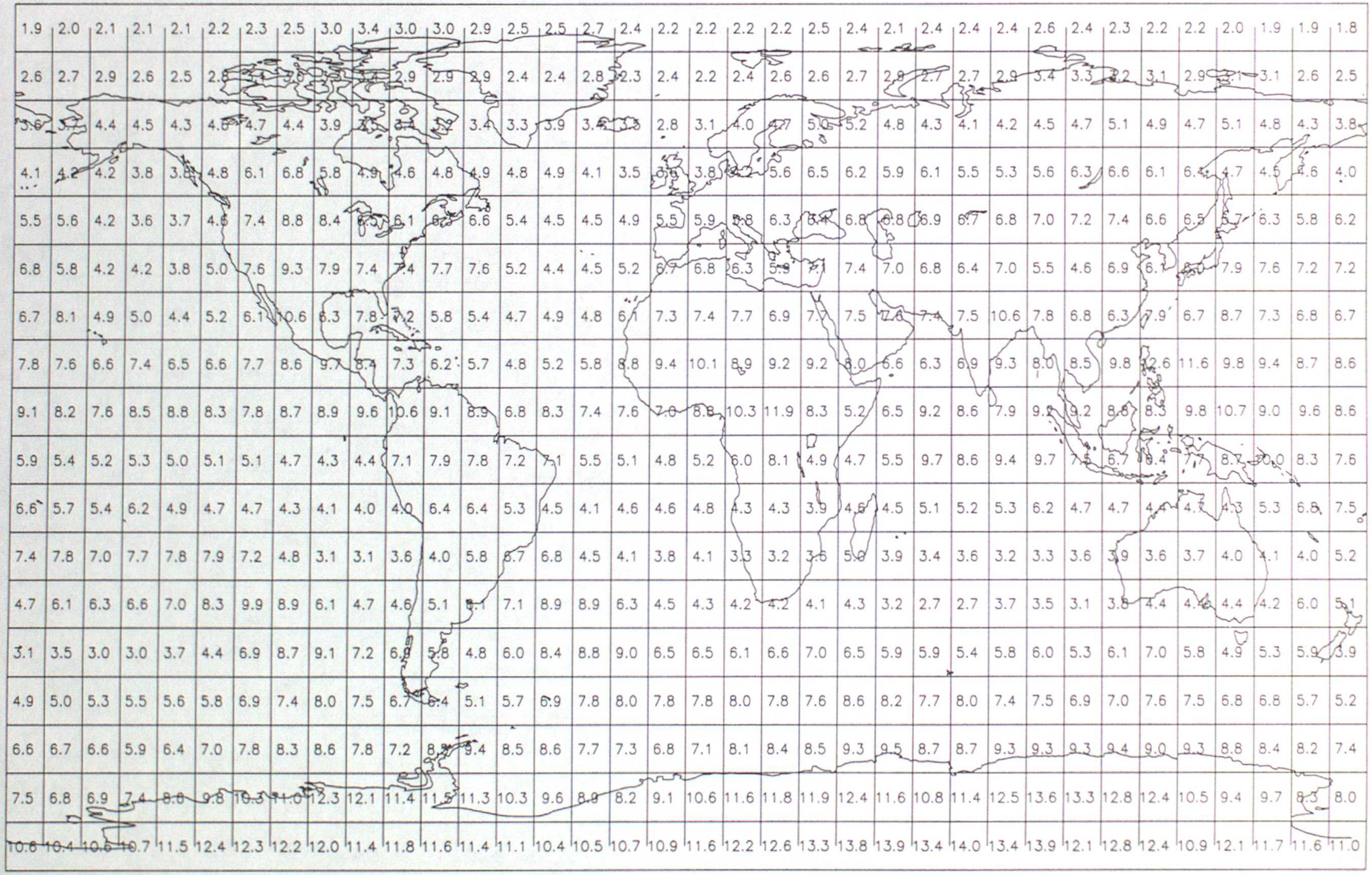
FIGURE 28



-.7	-.8	-1.0	-1.0	-.9	-1.0	-1.2	-1.5	-1.8	-1.9	-1.5	-1.5	-1.4	-1.1	-1.0	-.9	-.7	-.5	-.6	-.6	-.5	-.5	-.3	-.2	-.4	-.4	-.8	-1.0	-1.0	-.8	-.8	-.7	-.5	-.5	-.5	-.5
-.6	-.7	-1.1	-.8	-.7	-1.0	-1.7	-1.5	-1.8	-1.6	-.8	-.5	-.7	-.4	-.4	-.3	-.3	-.5	-.7	-.7	-.7	-.5	-.4	-.6	-.5	-.6	-1.1	-2.0	-2.3	-1.6	-1.2	-.9	-1.0	-.9	-.5	-.5
-.9	-1.5	-3.3	-3.1	-3.0	-2.6	-1.9	-1.9	-1.8	-2.1	-.9	-.4	-.7	-.7	-1.1	-1.2	-1.4	-1.1	-1.5	-3.0	-3.3	-3.6	-2.1	-1.5	-1.4	-1.7	-2.1	-2.8	-3.3	-3.8	-3.4	-3.0	-3.4	-2.8	-2.1	-1.5
-2.4	-2.6	-2.7	-2.3	-2.3	-3.2	-4.2	-4.3	-3.1	-2.3	-2.5	-3.0	-2.3	-2.4	-2.5	-2.1	-1.6	-2.0	-2.3	-3.3	-4.5	-5.1	-3.7	-3.0	-3.2	-2.8	-2.8	-3.8	-5.1	-6.0	-4.7	-4.3	-2.7	-2.3	-2.3	-1.9
-4.6	-3.8	-2.1	-2.1	-1.8	-1.5	-3.6	-5.7	-4.2	[illegible]	-4.2	-4.0	-4.1	-2.1	-1.7	-2.1	-2.7	-2.9	-3.5	-3.4	-3.6	-2.7	-2.0	-2.3	-2.5	-3.8	-4.9	-4.8	-6.0	-6.2	-3.6	-3.4	-3.0	-3.7	-3.3	-4.0
-3.9	-2.5	-1.4	-1.6	-1.1	-1.9	-2.7	-5.8	-4.0	-4.0	-4.6	-5.3	-4.4	-1.7	-1.0	-1.5	-1.9	-2.8	-2.8	-2.5	-1.8	-2.0	-2.2	-1.8	-1.2	-3.2	-5.6	-3.9	-3.4	-4.8	-2.6	-2.7	-4.9	-4.8	-4.7	-4.1
-3.0	-5.6	-2.0	-1.8	-1.9	-2.6	-2.5	-6.7	-2.5	-3.9	-3.3	-2.2	-2.0	-1.1	-1.3	-1.2	-2.2	-3.0	-2.6	-4.9	-3.9	-3.3	-2.7	-2.9	-3.2	-3.9	-4.8	-4.9	-4.7	-2.6	-2.9	-2.7	-4.9	-3.9	-3.5	-2.8
-4.9	-4.8	-3.5	-4.7	-3.5	-3.4	-4.0	-5.1	-6.3	-5.7	-3.7	-2.6	-2.0	-1.4	-1.8	-2.5	-5.9	-5.8	-6.4	-6.5	-6.7	-6.9	-4.6	-4.5	-5.1	-5.6	-7.9	-7.3	-8.5	-9.4	-13.2	-9.1	-7.0	-6.3	-5.9	-5.3
-5.1	-4.2	-3.9	-5.0	-5.2	-5.2	-4.9	-5.6	-5.9	-7.1	-8.3	-7.3	-6.0	-3.4	-5.4	-4.4	-4.9	-3.8	-7.6	-9.2	-11.9	-6.0	-2.9	-4.7	-8.0	-6.7	-5.1	-7.6	-6.8	-6.7	-6.9	-8.9	-9.2	-6.5	-7.8	-6.1
-2.0	-1.5	-1.3	-1.6	-1.5	-1.6	-1.8	-1.6	-1.6	-2.0	-4.6	-5.8	-5.2	-3.6	-4.0	-2.2	-1.7	-1.4	-2.3	-3.2	-4.7	-1.7	-2.1	-3.7	-7.7	-6.1	-6.4	-7.3	-4.1	-3.4	-3.7	-5.6	-7.0	-7.0	-5.4	-4.3
-3.5	-2.0	-1.9	-2.3	-1.7	-1.4	-1.5	-1.4	-1.4	-1.5	-1.8	-3.1	-3.5	-2.3	-1.5	-1.2	-1.7	-1.6	-1.8	-1.0	-1.5	-1.1	-1.7	-1.8	-2.1	-2.6	-2.5	-3.6	-2.2	-1.2	-1.0	-1.3	-1.2	-2.2	-3.4	-4.9
-4.5	-5.7	-5.3	-5.0	-5.5	-5.5	-4.4	-1.9	-1.1	-.9	-.9	-.6	-2.5	-3.7	-3.1	-1.5	-1.4	-1.3	-1.8	-.2	-.6	-.8	-2.1	-1.7	-1.0	-1.3	-1.1	-1.4	-1.9	-1.4	-.8	-.8	-.6	-.8	-1.0	-2.3
-1.8	-3.0	-3.6	-3.6	-3.9	-4.9	-8.3	-7.2	-3.3	-1.8	-1.4	-1.8	-3.3	-4.6	-4.9	-4.8	-2.7	-2.1	-2.0	-1.8	-1.1	-.9	-1.3	-1.0	-.7	-.4	-.5	-.6	-.7	-.8	-1.0	-1.2	-.5	-.7	-2.7	-2.1
.1	.2	.4	.4	.2	-.3	-2.3	-3.9	-4.7	-3.2	-3.0	-1.7	-1.3	-2.2	-3.5	-3.7	-3.1	-1.6	-1.7	-1.7	-2.1	-1.9	-1.5	-1.2	-1.3	-1.2	-1.9	-2.3	-1.7	-2.3	-3.3	-2.1	-1.4	-1.5	-2.0	.2
.0	-.2	-.3	-.7	-.9	-.5	-1.1	-1.6	-1.8	-1.7	-1.6	-1.1	-.2	-.7	-1.1	-.7	-.4	-.2	-.6	-1.3	-.9	-.6	-1.2	-1.2	-.8	-.9	-.9	-1.3	-1.1	-1.3	-2.9	-2.7	-1.8	-2.3	-1.1	-.3
.6	.3	.7	1.3	.5	-.4	-1.2	-1.6	-1.8	-1.0	-.4	[illegible]	-.8	.0	.1	1.1	2.0	2.3	2.3	1.5	1.1	1.5	1.5	2.2	1.9	1.3	1.8	2.4	1.8	.4	.4	.8	.2	-.6	-.5	.3
3.0	3.0	2.6	2.1	1.3	.5	-.2	-2.0	-2.9	-2.0	-2.0	-1.3	-2.0	-1.1	-.1	1.7	3.7	5.0	5.8	6.2	6.5	6.9	7.6	7.2	6.7	6.7	7.9	8.7	7.9	7.4	7.9	6.2	5.3	5.3	3.6	3.5
5.2	5.0	4.2	3.9	3.4	3.0	3.1	3.7	3.2	2.2	1.7	1.3	1.5	2.5	3.8	5.5	6.4	6.7	7.3	8.0	8.4	8.9	9.3	9.5	8.9	9.9	9.1	9.7	7.6	8.5	7.9	6.5	7.9	7.4	6.0	5.3

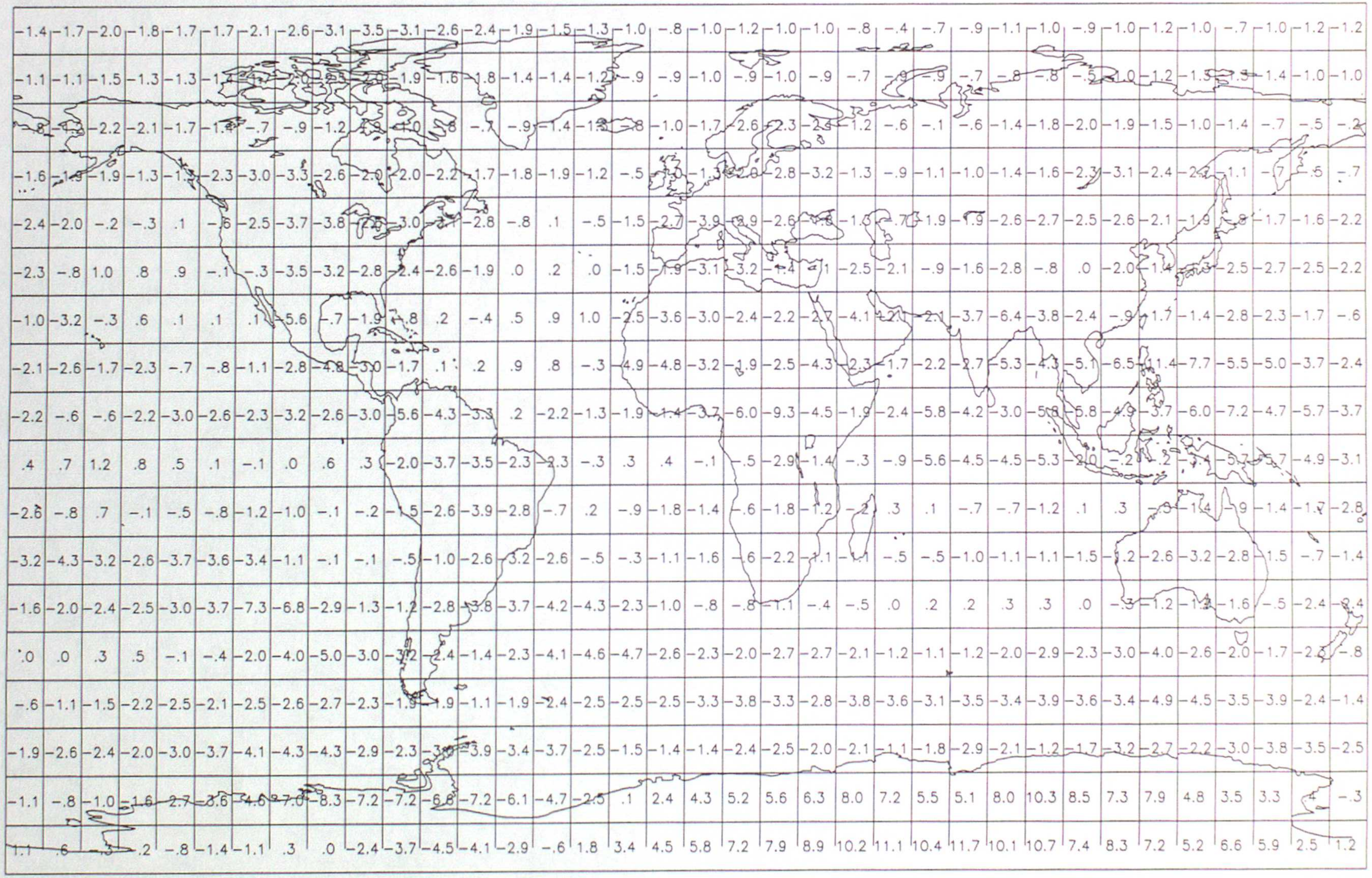
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JULY 2000 : HIRS15 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 29



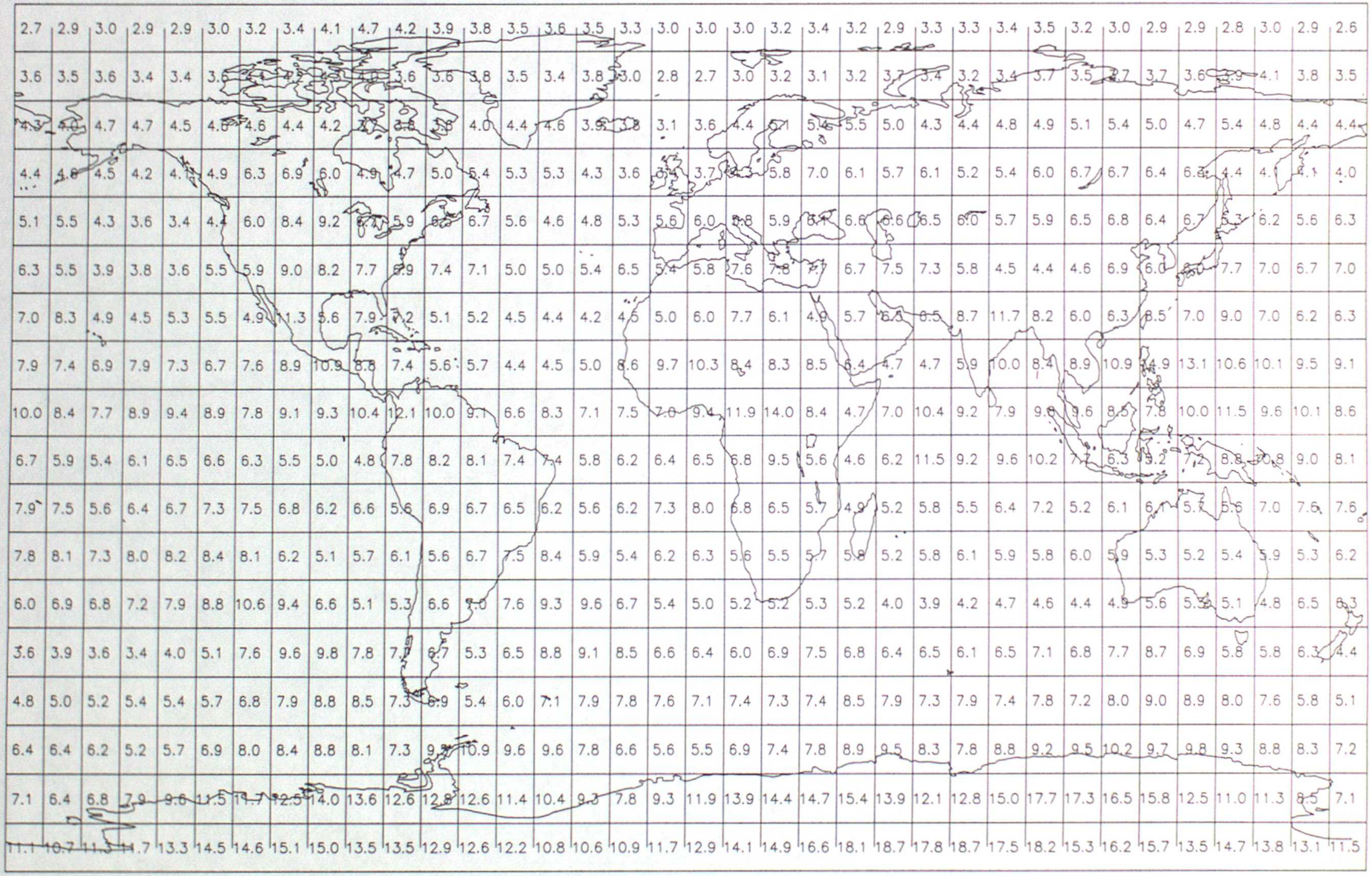
1.9	2.0	2.1	2.1	2.1	2.2	2.3	2.5	3.0	3.4	3.0	3.0	2.9	2.5	2.5	2.7	2.4	2.2	2.2	2.2	2.2	2.5	2.4	2.1	2.4	2.4	2.4	2.6	2.4	2.3	2.2	2.2	2.0	1.9	1.9	1.8
2.6	2.7	2.9	2.6	2.5	2.8	[illegible]	3.0	[illegible]	3.4	2.9	2.9	2.9	2.4	2.4	2.8	2.3	2.4	2.2	2.4	2.6	2.6	2.7	2.8	2.7	2.7	2.9	3.4	3.3	2.2	3.1	2.9	3.1	3.1	2.6	2.5
3.6	3.7	4.4	4.5	4.3	4.6	4.7	4.4	3.9	3.5	3.4	3.2	3.4	3.3	3.9	3.4	3.5	2.8	3.1	4.0	4.7	5.0	5.2	4.8	4.3	4.1	4.2	4.5	4.7	5.1	4.9	4.7	5.1	4.8	4.3	3.8
4.1	4.2	4.2	3.8	3.8	4.8	6.1	6.8	5.8	4.9	4.6	4.8	4.9	4.8	4.9	4.1	3.5	3.6	3.8	4.2	5.6	6.5	6.2	5.9	6.1	5.5	5.3	5.6	6.3	6.6	6.1	6.4	4.7	4.5	4.6	4.0
5.5	5.6	4.2	3.6	3.7	4.6	7.4	8.8	8.4	6.5	6.1	6.3	6.6	5.4	4.5	4.5	4.9	5.5	5.9	5.8	6.3	6.4	6.8	6.8	6.9	6.7	6.8	7.0	7.2	7.4	6.6	6.5	5.7	6.3	5.8	6.2
6.8	5.8	4.2	4.2	3.8	5.0	7.6	9.3	7.9	7.4	7.4	7.7	7.6	5.2	4.4	4.5	5.2	6.7	6.8	6.3	5.9	7.1	7.4	7.0	6.8	6.4	7.0	5.5	4.6	6.9	6.1	8.0	7.9	7.6	7.2	7.2
6.7	8.1	4.9	5.0	4.4	5.2	6.1	10.6	6.3	7.8	7.2	5.8	5.4	4.7	4.9	4.8	6.1	7.3	7.4	7.7	6.9	7.7	7.5	7.6	7.4	7.5	10.6	7.8	6.8	6.3	7.9	6.7	8.7	7.3	6.8	6.7
7.8	7.6	6.6	7.4	6.5	6.6	7.7	8.6	9.7	8.4	7.3	6.2	5.7	4.8	5.2	5.8	8.8	9.4	10.1	8.9	9.2	9.2	8.0	6.6	6.3	6.9	9.3	8.0	8.5	9.8	12.6	11.6	9.8	9.4	8.7	8.6
9.1	8.2	7.6	8.5	8.8	8.3	7.8	8.7	8.9	9.6	10.6	9.1	8.9	6.8	8.3	7.4	7.6	7.0	8.8	10.3	11.9	8.3	5.2	6.5	9.2	8.6	7.9	9.2	9.2	8.8	8.3	9.8	10.7	9.0	9.6	8.6
5.9	5.4	5.2	5.3	5.0	5.1	5.1	4.7	4.3	4.4	7.1	7.9	7.8	7.2	7.1	5.5	5.1	4.8	5.2	6.0	8.1	4.9	4.7	5.5	9.7	8.6	9.4	9.7	7.5	6.7	8.4	7.7	8.7	10.0	8.3	7.6
6.6	5.7	5.4	6.2	4.9	4.7	4.7	4.3	4.1	4.0	4.0	6.4	6.4	5.3	4.5	4.1	4.6	4.6	4.8	4.3	4.3	3.9	4.6	4.5	5.1	5.2	5.3	6.2	4.7	4.7	4.4	4.7	4.3	5.3	6.8	7.5
7.4	7.8	7.0	7.7	7.8	7.9	7.2	4.8	3.1	3.1	3.6	4.0	5.8	6.7	6.8	4.5	4.1	3.8	4.1	3.3	3.2	3.6	5.0	3.9	3.4	3.6	3.2	3.3	3.6	3.9	3.6	3.7	4.0	4.1	4.0	5.2
4.7	6.1	6.3	6.6	7.0	8.3	9.9	8.9	6.1	4.7	4.6	5.1	8.1	7.1	8.9	8.9	6.3	4.5	4.3	4.2	4.2	4.1	4.3	3.2	2.7	2.7	3.7	3.5	3.1	3.8	4.4	4.6	4.4	4.2	6.0	5.1
3.1	3.5	3.0	3.0	3.7	4.4	6.9	8.7	9.1	7.2	6.9	5.8	4.8	6.0	8.4	8.8	9.0	6.5	6.5	6.1	6.6	7.0	6.5	5.9	5.9	5.4	5.8	6.0	5.3	6.1	7.0	5.8	4.9	5.3	5.9	3.9
4.9	5.0	5.3	5.5	5.6	5.8	6.9	7.4	8.0	7.5	6.7	6.4	5.1	5.7	6.9	7.8	8.0	7.8	7.8	8.0	7.8	7.6	8.6	8.2	7.7	8.0	7.4	7.5	6.9	7.0	7.6	7.5	6.8	6.8	5.7	5.2
6.6	6.7	6.6	5.9	6.4	7.0	7.8	8.3	8.6	7.8	7.2	8.5	9.4	8.5	8.6	7.7	7.3	6.8	7.1	8.1	8.4	8.5	9.3	9.5	8.7	8.7	9.3	9.3	9.3	9.4	9.0	9.3	8.8	8.4	8.2	7.4
7.5	6.8	6.9	7.4	8.6	9.8	10.3	11.0	12.3	12.1	11.4	11.5	11.3	10.3	9.6	8.9	8.2	9.1	10.6	11.6	11.8	11.9	12.4	11.6	10.8	11.4	12.5	13.6	13.3	12.8	12.4	10.5	9.4	9.7	8.3	8.0
10.6	10.4	10.6	10.7	11.5	12.4	12.3	12.2	12.0	11.4	11.8	11.6	11.4	11.1	10.4	10.5	10.7	10.9	11.6	12.2	12.6	13.3	13.8	13.9	13.4	14.0	13.4	13.9	12.1	12.8	12.4	10.9	12.1	11.7	11.6	11.0

ATOVS : MEAN O−B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)   FIGURE 30
JULY 2000   : HIRS11 Channel (500−700 hPa)
NOAA−15, USING ALL OBSERVATIONS


−1.4 −1.7 −2.0 −1.8 −1.7 −1.7 −2.1 −2.6 −3.1 −3.5 −3.1 −2.6 −2.4 −1.9 −1.5 −1.3 −1.0 −.8 −1.0 −1.2 −1.0 −1.0 −.8 −.4 −.7 −.9 −1.1 −1.0 −.9 −1.0 −1.2 −1.0 −.7 −1.0 −1.2 −1.2
−1.1 −1.1 −1.5 −1.3 −1.3 −1.7 −1.7 −2.0 −2.5 −2.0 −1.9 −1.6 −1.8 −1.4 −1.4 −1.2 −.9 −.9 −1.0 −.9 −1.0 −.9 −.7 −.9 −.9 −.7 −.8 −.8 −.5 −1.0 −1.2 −1.5 −1.3 −1.4 −1.0 −1.0
−.8 −1.3 −2.2 −2.1 −1.7 −1.4 −.7 −.9 −1.2 −1.9 −1.0 −.8 −.7 −.9 −1.4 −1.3 −.8 −1.0 −1.7 −2.6 −2.3 −2.3 −1.2 −.6 −.1 −.6 −1.4 −1.8 −2.0 −1.9 −1.5 −1.0 −1.4 −.7 −.5 −.2
−1.6 −1.9 −1.9 −1.3 −1.3 −2.3 −3.0 −3.3 −2.6 −2.0 −2.0 −2.2 −1.7 −1.8 −1.9 −1.2 −.5 −1.0 −1.3 −2.0 −2.8 −3.2 −1.3 −.9 −1.1 −1.0 −1.4 −1.6 −2.3 −3.1 −2.4 −2.1 −1.1 −.7 −.5 −.7
−2.4 −2.0 −.2 −.3 .1 −.6 −2.5 −3.7 −3.8 −2.5 −3.0 −3.1 −2.8 −.8 .1 −.5 −1.5 −2.7 −3.9 −2.9 −2.6 −1.8 −1.6 −.7 −1.9 −1.9 −2.6 −2.7 −2.5 −2.6 −2.1 −1.9 −.8 −1.7 −1.6 −2.2
−2.3 −.8 1.0 .8 .9 −.1 −.3 −3.5 −3.2 −2.8 −2.4 −2.6 −1.9 .0 .2 .0 −1.5 −1.9 −3.1 −3.2 −1.4 .1 −2.5 −2.1 −.9 −1.6 −2.8 −.8 .0 −2.0 −1.4 −2.3 −2.5 −2.7 −2.5 −2.2
−1.0 −3.2 −.3 .6 .1 .1 .1 −5.6 −.7 −1.9 −.8 .2 −.4 .5 .9 1.0 −2.5 −3.6 −3.0 −2.4 −2.2 −2.7 −4.1 −2.1 −2.1 −3.7 −6.4 −3.8 −2.4 −.9 −1.7 −1.4 −2.8 −2.3 −1.7 −.6
−2.1 −2.6 −1.7 −2.3 −.7 −.8 −1.1 −2.8 −4.8 −3.0 −1.7 .1 .2 .9 .8 −.3 −4.9 −4.8 −3.2 −1.9 −2.5 −4.3 −2.3 −1.7 −2.2 −2.7 −5.3 −4.3 −5.1 −6.5 −11.4 −7.7 −5.5 −5.0 −3.7 −2.4
−2.2 −.6 −.6 −2.2 −3.0 −2.6 −2.3 −3.2 −2.6 −3.0 −5.6 −4.3 −3.3 .2 −2.2 −1.3 −1.9 −1.4 −3.7 −6.0 −9.3 −4.5 −1.9 −2.4 −5.8 −4.2 −3.0 −5.8 −5.8 −4.9 −3.7 −6.0 −7.2 −4.7 −5.7 −3.7
.4 .7 1.2 .8 .5 .1 −.1 .0 .6 .3 −2.0 −3.7 −3.5 −2.3 −2.3 −.3 .3 .4 −.1 −.5 −2.9 −1.4 −.3 −.9 −5.6 −4.5 −4.5 −5.3 −2.0 −.2 −.2 −3.4 −5.7 −5.7 −4.9 −3.1
−2.6 −.8 .7 −.1 −.5 −.8 −1.2 −1.0 −.1 −.2 −1.5 −2.6 −3.9 −2.8 −.7 .2 −.9 −1.8 −1.4 −.6 −1.8 −1.2 −.2 .3 .1 −.7 −.7 −1.2 .1 .3 −.3 −1.4 −.9 −1.4 −1.7 −2.8
−3.2 −4.3 −3.2 −2.6 −3.7 −3.6 −3.4 −1.1 −.1 −.1 −.5 −1.0 −2.6 −3.2 −2.6 −.5 −.3 −1.1 −1.6 −.6 −2.2 −1.1 −1.1 −.5 −.5 −1.0 −1.1 −1.1 −1.5 −1.2 −2.6 −3.2 −2.8 −1.5 −.7 −1.4
−1.6 −2.0 −2.4 −2.5 −3.0 −3.7 −7.3 −6.8 −2.9 −1.3 −1.2 −2.8 −3.8 −3.7 −4.2 −4.3 −2.3 −1.0 −.8 −.8 −1.1 −.4 −.5 .0 .2 .2 .3 .3 .0 −.3 −1.2 −1.3 −1.6 −.5 −2.4 −2.4
.0 .0 .3 .5 −.1 −.4 −2.0 −4.0 −5.0 −3.0 −3.2 −2.4 −1.4 −2.3 −4.1 −4.6 −4.7 −2.6 −2.3 −2.0 −2.7 −2.7 −2.1 −1.2 −1.1 −1.2 −2.0 −2.9 −2.3 −3.0 −4.0 −2.6 −2.0 −1.7 −2.3 −.8
−.6 −1.1 −1.5 −2.2 −2.5 −2.1 −2.5 −2.6 −2.7 −2.3 −1.9 −1.9 −1.1 −1.9 −2.4 −2.5 −2.5 −2.5 −3.3 −3.8 −3.3 −2.8 −3.8 −3.6 −3.1 −3.5 −3.4 −3.9 −3.6 −3.4 −4.9 −4.5 −3.5 −3.9 −2.4 −1.4
−1.9 −2.6 −2.4 −2.0 −3.0 −3.7 −4.1 −4.3 −4.3 −2.9 −2.3 −3.0 −3.9 −3.4 −3.7 −2.5 −1.5 −1.4 −1.4 −2.4 −2.5 −2.0 −2.1 −1.1 −1.8 −2.9 −2.1 −1.2 −1.7 −3.2 −2.7 −2.2 −3.0 −3.8 −3.5 −2.5
−1.1 −.8 −1.0 −1.6 −2.7 −3.6 −4.6 −7.0 −8.3 −7.2 −7.2 −6.8 −7.2 −6.1 −4.7 −2.5 .1 2.4 4.3 5.2 5.6 6.3 8.0 7.2 5.5 5.1 8.0 10.3 8.5 7.3 7.9 4.8 3.5 3.3 .4 −.3
1.1 .6 −.3 .2 −.8 −1.4 −1.1 .3 .0 −2.4 −3.7 −4.5 −4.1 −2.9 −.6 1.8 3.4 4.5 5.8 7.2 7.9 8.9 10.2 11.1 10.4 11.7 10.1 10.7 7.4 8.3 7.2 5.2 6.6 5.9 2.5 1.2

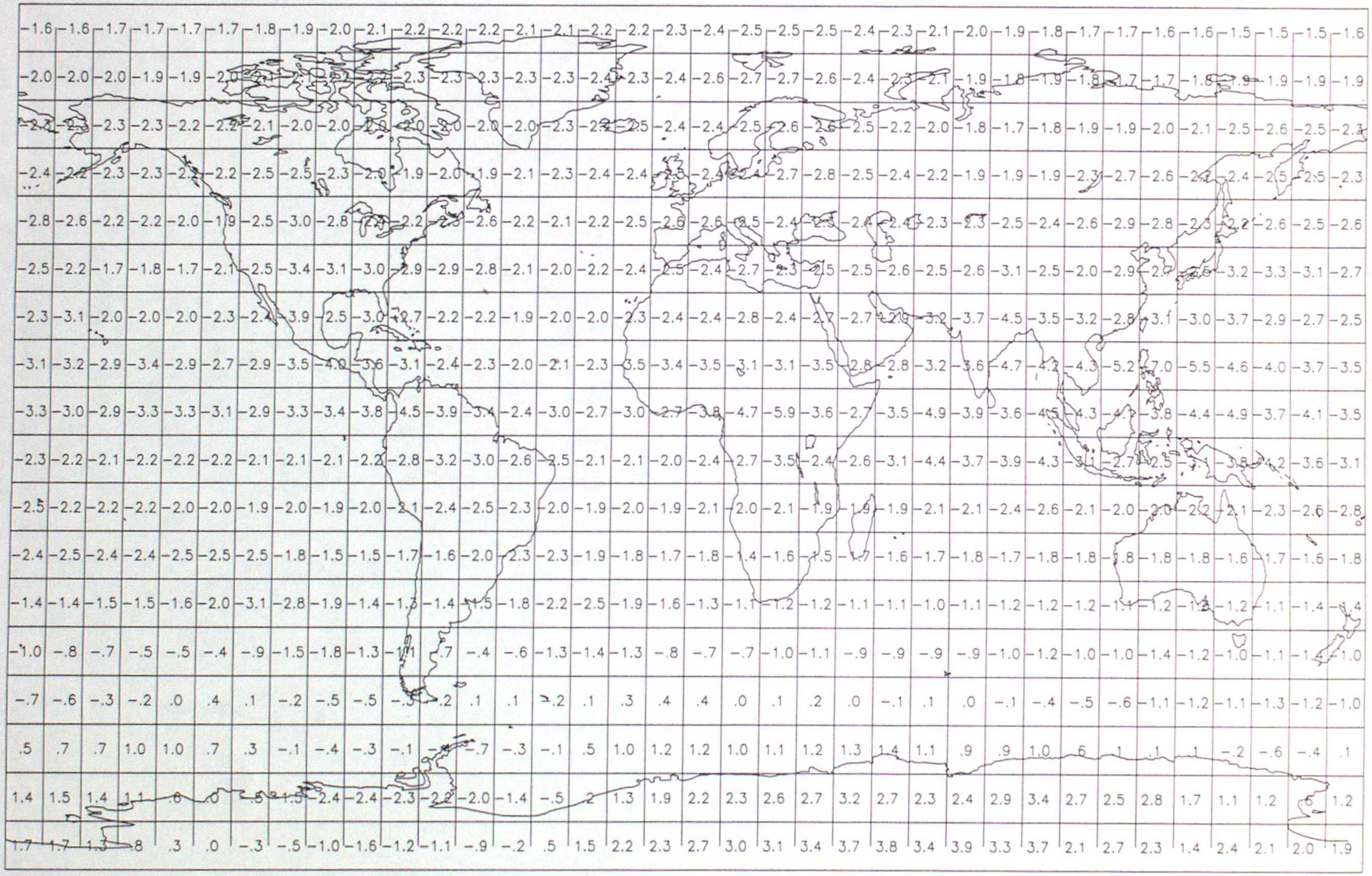
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JULY 2000 : HIRS11 channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 31



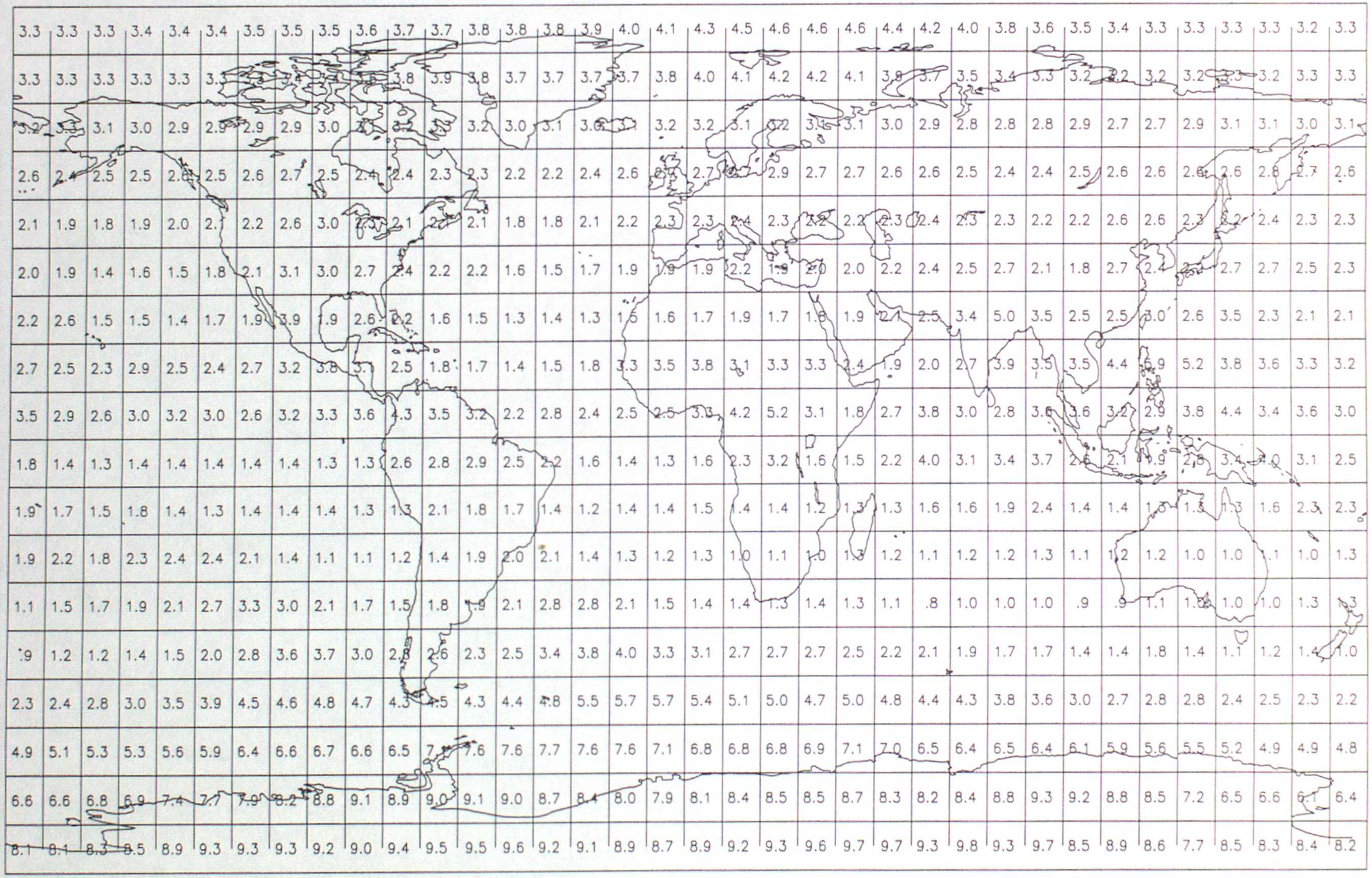
2.7	2.9	3.0	2.9	2.9	3.0	3.2	3.4	4.1	4.7	4.2	3.9	3.8	3.5	3.6	3.5	3.3	3.0	3.0	3.0	3.2	3.4	3.2	2.9	3.3	3.3	3.4	3.5	3.2	3.0	2.9	2.9	2.8	3.0	2.9	2.6
3.6	3.5	3.6	3.4	3.4	3.6	4.4	4.7	4.3	4.0	3.6	3.6	3.8	3.5	3.4	3.8	3.0	2.8	2.7	3.0	3.2	3.1	3.2	3.7	3.4	3.2	3.4	3.7	3.5	3.7	3.7	3.6	3.9	4.1	3.8	3.5
4.3	4.0	4.7	4.7	4.5	4.6	4.6	4.4	4.2	3.7	3.8	3.8	4.0	4.4	4.6	3.9	3.8	3.1	3.6	4.4	5.1	5.4	5.5	5.0	4.3	4.4	4.8	4.9	5.1	5.4	5.0	4.7	5.4	4.8	4.4	4.4
4.4	4.8	4.5	4.2	4.1	4.9	6.3	6.9	6.0	4.9	4.7	5.0	5.4	5.3	5.3	4.3	3.6	3.4	3.7	4.3	5.8	7.0	6.1	5.7	6.1	5.2	5.4	6.0	6.7	6.7	6.4	6.3	4.4	4.1	4.1	4.0
5.1	5.5	4.3	3.6	3.4	4.4	6.0	8.4	9.2	6.7	5.9	6.5	6.7	5.6	4.6	4.8	5.3	5.6	6.0	5.8	5.9	6.1	6.6	6.6	6.5	6.0	5.7	5.9	6.5	6.8	6.4	6.7	5.3	6.2	5.6	6.3
6.3	5.5	3.9	3.8	3.6	5.5	5.9	9.0	8.2	7.7	6.9	7.4	7.1	5.0	5.0	5.4	6.5	5.4	5.8	7.6	7.8	7.7	6.7	7.5	7.3	5.8	4.5	4.4	4.6	6.9	6.0	8.0	7.7	7.0	6.7	7.0
7.0	8.3	4.9	4.5	5.3	5.5	4.9	11.3	5.6	7.9	7.2	5.1	5.2	4.5	4.4	4.2	4.5	5.0	6.0	7.7	6.1	4.9	5.7	6.5	6.5	8.7	11.7	8.2	6.0	6.3	8.5	7.0	9.0	7.0	6.2	6.3
7.9	7.4	6.9	7.9	7.3	6.7	7.6	8.9	10.9	8.8	7.4	5.6	5.7	4.4	4.5	5.0	8.6	9.7	10.3	8.4	8.3	8.5	5.4	4.7	4.7	5.9	10.0	8.4	8.9	10.9	14.9	13.1	10.6	10.1	9.5	9.1
10.0	8.4	7.7	8.9	9.4	8.9	7.8	9.1	9.3	10.4	12.1	10.0	9.1	6.6	8.3	7.1	7.5	7.0	9.4	11.9	14.0	8.4	4.7	7.0	10.4	9.2	7.9	9.8	9.6	8.5	7.8	10.0	11.5	9.6	10.1	8.6
6.7	5.9	5.4	6.1	6.5	6.6	6.3	5.5	5.0	4.8	7.8	8.2	8.1	7.4	7.4	5.8	6.2	6.4	6.5	6.8	9.5	5.6	4.6	6.2	11.5	9.2	9.6	10.2	7.7	6.3	5.2	7.2	8.8	10.8	9.0	8.1
7.9	7.5	5.6	6.4	6.7	7.3	7.5	6.8	6.2	6.6	5.6	6.9	6.7	6.5	6.2	5.6	6.2	7.3	8.0	6.8	6.5	5.7	4.9	5.2	5.8	5.5	6.4	7.2	5.2	6.1	6.1	5.7	5.6	7.0	7.6	7.6
7.8	8.1	7.3	8.0	8.2	8.4	8.1	6.2	5.1	5.7	6.1	5.6	6.7	7.5	8.4	5.9	5.4	6.2	6.3	5.6	5.5	5.7	5.8	5.2	5.8	6.1	5.9	5.8	6.0	5.9	5.3	5.2	5.4	5.9	5.3	6.2
6.0	6.9	6.8	7.2	7.9	8.8	10.6	9.4	6.6	5.1	5.3	6.6	7.0	7.6	9.3	9.6	6.7	5.4	5.0	5.2	5.2	5.3	5.2	4.0	3.9	4.2	4.7	4.6	4.4	4.9	5.6	5.3	5.1	4.8	6.5	6.3
3.6	3.9	3.6	3.4	4.0	5.1	7.6	9.6	9.8	7.8	7.7	6.7	5.3	6.5	8.8	9.1	8.5	6.6	6.4	6.0	6.9	7.5	6.8	6.4	6.5	6.1	6.5	7.1	6.8	7.7	8.7	6.9	5.8	5.8	6.3	4.4
4.8	5.0	5.2	5.4	5.4	5.7	6.8	7.9	8.8	8.5	7.3	6.9	5.4	6.0	7.1	7.9	7.8	7.6	7.1	7.4	7.3	7.4	8.5	7.9	7.3	7.9	7.4	7.8	7.2	8.0	9.0	8.9	8.0	7.6	5.8	5.1
6.4	6.4	6.2	5.2	5.7	6.9	8.0	8.4	8.8	8.1	7.3	9.5	10.9	9.6	9.6	7.8	6.6	5.6	5.5	6.9	7.4	7.8	8.9	9.5	8.3	7.8	8.8	9.2	9.5	10.2	9.7	9.8	9.3	8.8	8.3	7.2
7.1	6.4	6.8	7.9	9.6	11.5	11.7	12.5	14.0	13.6	12.6	12.8	12.6	11.4	10.4	9.3	7.8	9.3	11.9	13.9	14.4	14.7	15.4	13.9	12.1	12.8	15.0	17.7	17.3	16.5	15.8	12.5	11.0	11.3	8.5	7.1
11.1	10.7	11.3	11.7	13.3	14.5	14.6	15.1	15.0	13.5	13.5	12.9	12.6	12.2	10.8	10.6	10.9	11.7	12.9	14.1	14.9	16.6	18.1	18.7	17.8	18.7	17.5	18.2	15.3	16.2	15.7	13.5	14.7	13.8	13.1	11.5

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 32
JULY 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS


-1.6 -1.6 -1.7 -1.7 -1.7 -1.7 -1.8 -1.9 -2.0 -2.1 -2.2 -2.2 -2.2 -2.1 -2.1 -2.2 -2.2 -2.3 -2.4 -2.5 -2.5 -2.5 -2.4 -2.3 -2.1 -2.0 -1.9 -1.8 -1.7 -1.7 -1.6 -1.6 -1.5 -1.5 -1.5 -1.6
-2.0 -2.0 -2.0 -1.9 -1.9 -2.0 -2.1 -2.1 -2.2 -2.2 -2.3 -2.3 -2.3 -2.3 -2.3 -2.4 -2.3 -2.4 -2.6 -2.7 -2.7 -2.6 -2.4 -2.3 -2.1 -1.9 -1.8 -1.9 -1.8 -1.7 -1.7 -1.8 -1.9 -1.9 -1.9 -1.9
-2.3 -2.3 -2.3 -2.3 -2.2 -2.2 -2.1 -2.0 -2.0 -2.0 -2.0 -2.0 -2.0 -2.0 -2.3 -2.3 -2.5 -2.4 -2.4 -2.5 -2.6 -2.6 -2.5 -2.2 -2.0 -1.8 -1.7 -1.8 -1.9 -1.9 -2.0 -2.1 -2.5 -2.6 -2.5 -2.3
-2.4 -2.2 -2.3 -2.3 -2.2 -2.2 -2.5 -2.5 -2.3 -2.0 -1.9 -2.0 -1.9 -2.1 -2.3 -2.4 -2.4 -2.5 -2.4 -2.4 -2.7 -2.8 -2.5 -2.4 -2.2 -1.9 -1.9 -1.9 -2.3 -2.7 -2.6 -2.4 -2.4 -2.5 -2.5 -2.3
-2.8 -2.6 -2.2 -2.2 -2.0 -1.9 -2.5 -3.0 -2.8 -2.2 -2.2 -2.3 -2.6 -2.2 -2.1 -2.2 -2.5 -2.6 -2.6 -2.5 -2.4 -2.3 -2.4 -2.4 -2.3 -2.3 -2.5 -2.4 -2.6 -2.9 -2.8 -2.3 -2.2 -2.6 -2.5 -2.6
-2.5 -2.2 -1.7 -1.8 -1.7 -2.1 -2.5 -3.4 -3.1 -3.0 -2.9 -2.9 -2.8 -2.1 -2.0 -2.2 -2.4 -2.5 -2.4 -2.7 -2.3 -2.5 -2.5 -2.6 -2.5 -2.6 -3.1 -2.5 -2.0 -2.9 -2.7 -2.6 -3.2 -3.3 -3.1 -2.7
-2.3 -3.1 -2.0 -2.0 -2.0 -2.3 -2.4 -3.9 -2.5 -3.0 -2.7 -2.2 -2.2 -1.9 -2.0 -2.0 -2.3 -2.4 -2.4 -2.8 -2.4 -2.7 -2.7 -2.9 -3.2 -3.7 -4.5 -3.5 -3.2 -2.8 -3.1 -3.0 -3.7 -2.9 -2.7 -2.5
-3.1 -3.2 -2.9 -3.4 -2.9 -2.7 -2.9 -3.5 -4.0 -3.6 -3.1 -2.4 -2.3 -2.0 -2.1 -2.3 -3.5 -3.4 -3.5 -3.1 -3.1 -3.5 -2.8 -2.8 -3.2 -3.6 -4.7 -4.2 -4.3 -5.2 -7.0 -5.5 -4.6 -4.0 -3.7 -3.5
-3.3 -3.0 -2.9 -3.3 -3.3 -3.1 -2.9 -3.3 -3.4 -3.8 -4.5 -3.9 -3.4 -2.4 -3.0 -2.7 -3.0 -2.7 -3.8 -4.7 -5.9 -3.6 -2.7 -3.5 -4.9 -3.9 -3.6 -4.5 -4.3 [illegible] -3.8 -4.4 -4.9 -3.7 -4.1 -3.5
-2.3 -2.2 -2.1 -2.2 -2.2 -2.2 -2.1 -2.1 -2.1 -2.2 -2.8 -3.2 -3.0 -2.6 -2.5 -2.1 -2.1 -2.0 -2.4 -2.7 -3.5 -2.4 -2.6 -3.1 -4.4 -3.7 -3.9 -4.3 -3.1 -2.7 -2.5 [illegible] -3.8 -4.2 -3.6 -3.1
-2.5 -2.2 -2.2 -2.2 -2.0 -2.0 -1.9 -2.0 -1.9 -2.0 -2.1 -2.4 -2.5 -2.3 -2.0 -1.9 -2.0 -1.9 -2.1 -2.0 -2.1 -1.9 -1.9 -1.9 -2.1 -2.1 -2.4 -2.6 -2.1 -2.0 -2.0 -2.2 -2.1 -2.3 -2.6 -2.8
-2.4 -2.5 -2.4 -2.4 -2.5 -2.5 -2.5 -1.8 -1.5 -1.5 -1.7 -1.6 -2.0 -2.3 -2.3 -1.9 -1.8 -1.7 -1.8 -1.4 -1.6 -1.5 -1.7 -1.6 -1.7 -1.8 -1.7 -1.8 -1.8 -1.8 -1.8 -1.8 -1.6 -1.7 -1.6 -1.8
-1.4 -1.4 -1.5 -1.5 -1.6 -2.0 -3.1 -2.8 -1.9 -1.4 -1.3 -1.4 -1.5 -1.8 -2.2 -2.5 -1.9 -1.6 -1.3 -1.1 -1.2 -1.2 -1.1 -1.1 -1.0 -1.1 -1.2 -1.2 -1.2 -1.1 -1.2 -1.3 -1.2 -1.1 -1.4 -1.4
-1.0 -.8 -.7 -.5 -.5 -.4 -.9 -1.5 -1.8 -1.3 -1.1 -.7 -.4 -.6 -1.3 -1.4 -1.3 -.8 -.7 -.7 -1.0 -1.1 -.9 -.9 -.9 -.9 -1.0 -1.2 -1.0 -1.0 -1.4 -1.2 -1.0 -1.1 -1.4 -1.0
-.7 -.6 -.3 -.2 .0 .4 .1 -.2 -.5 -.5 -.3 .2 .1 .1 .2 .1 .3 .4 .4 .0 .1 .2 .0 -.1 .1 .0 -.1 -.4 -.5 -.6 -1.1 -1.2 -1.1 -1.3 -1.2 -1.0
.5 .7 .7 1.0 1.0 .7 .3 -.1 -.4 -.3 -.1 [illegible] -.7 -.3 -.1 .5 1.0 1.2 1.2 1.0 1.1 1.2 1.3 1.4 1.1 .9 .9 1.0 .6 .1 .1 .1 -.2 -.6 -.4 .1
1.4 1.5 1.4 1.1 .6 .0 -.5 -1.5 -2.4 -2.4 -2.3 -2.2 -2.0 -1.4 -.5 .2 1.3 1.9 2.2 2.3 2.6 2.7 3.2 2.7 2.3 2.4 2.9 3.4 2.7 2.5 2.8 1.7 1.1 1.2 .6 1.2
1.7 1.7 1.3 .8 .3 .0 -.3 -.5 -1.0 -1.6 -1.2 -1.1 -.9 -.2 .5 1.5 2.2 2.3 2.7 3.0 3.1 3.4 3.7 3.8 3.4 3.9 3.3 3.7 2.1 2.7 2.3 1.4 2.4 2.1 2.0 1.9

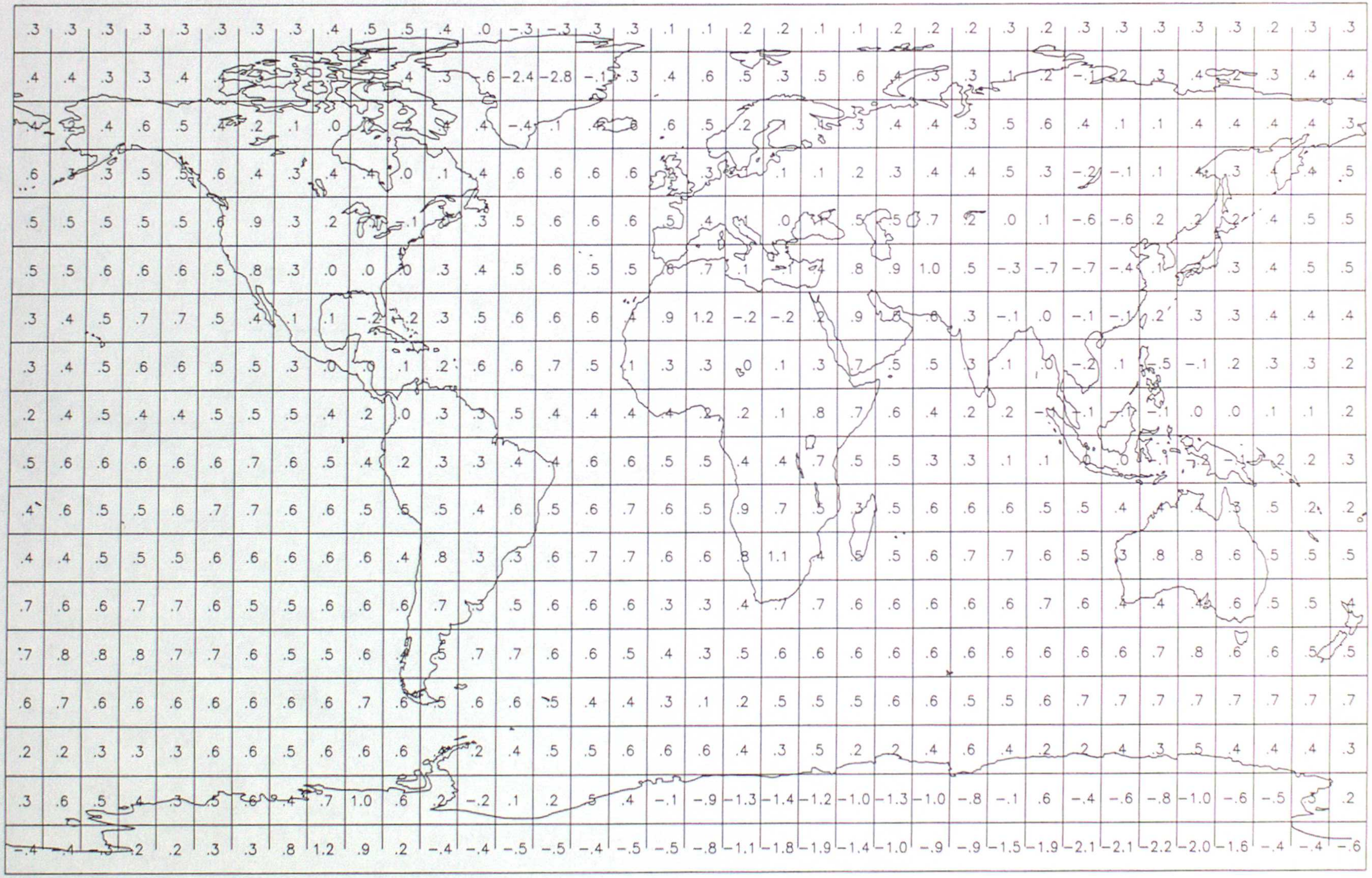
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JULY 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 33



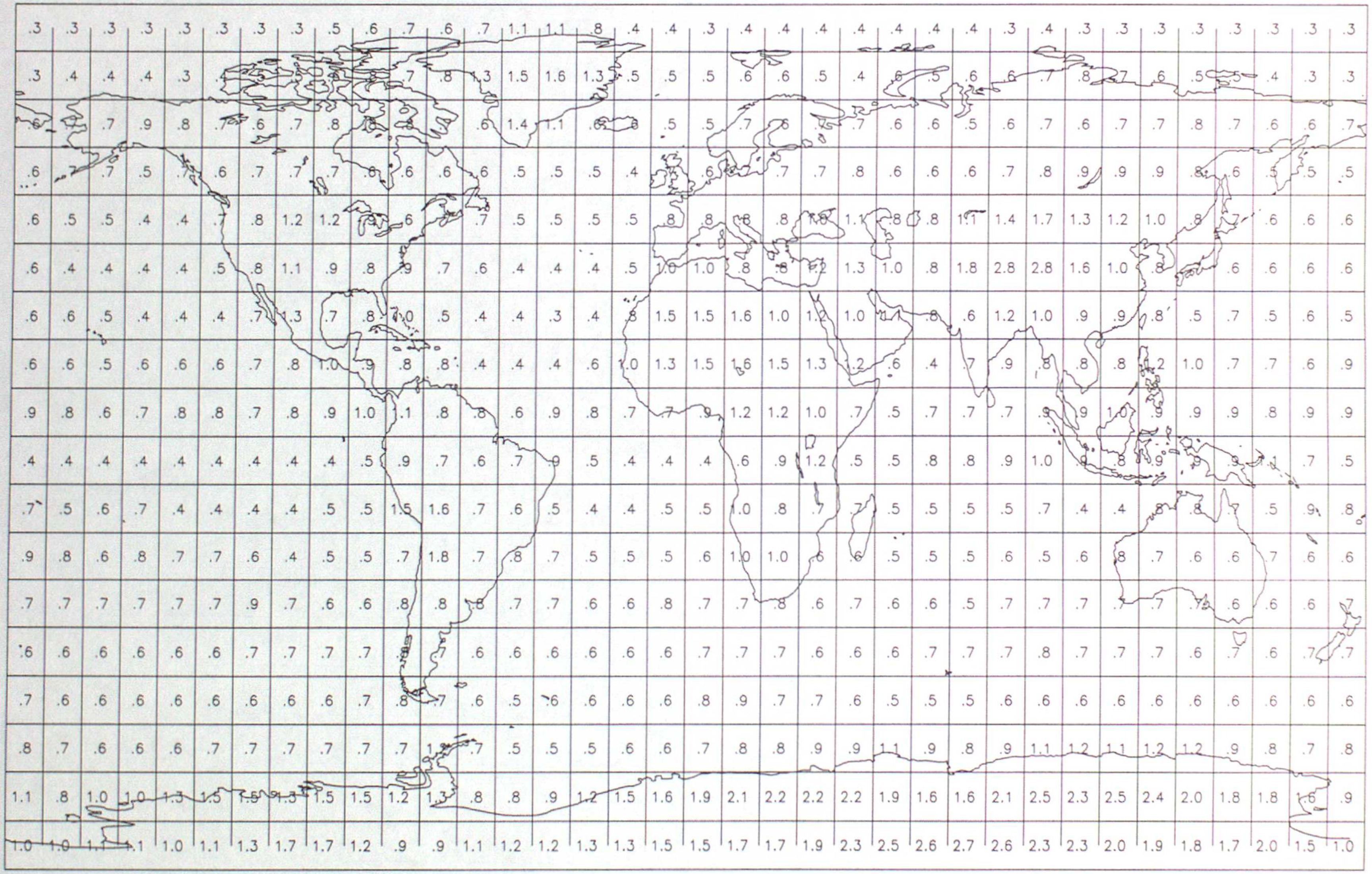
3.3	3.3	3.3	3.4	3.4	3.4	3.5	3.5	3.5	3.6	3.7	3.7	3.8	3.8	3.8	3.9	4.0	4.1	4.3	4.5	4.6	4.6	4.6	4.4	4.2	4.0	3.8	3.6	3.5	3.4	3.3	3.3	3.3	3.3	3.2	3.3
3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.6	3.8	3.9	3.8	3.7	3.7	3.7	3.7	3.8	4.0	4.1	4.2	4.2	4.1	3.8	3.7	3.5	3.4	3.3	3.2	3.2	3.2	3.2	3.3	3.2	3.3	3.3
3.2	3.3	3.1	3.0	2.9	2.9	2.9	2.9	3.0	3.1	3.2	3.3	3.2	3.0	3.1	3.0	3.1	3.2	3.2	3.1	3.2	3.1	3.1	3.0	2.9	2.8	2.8	2.8	2.9	2.7	2.7	2.9	3.1	3.1	3.0	3.1
2.6	2.4	2.5	2.5	2.8	2.5	2.6	2.7	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.4	2.6	[illegible]	2.7	2.7	2.9	2.7	2.7	2.6	2.6	2.5	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.8	2.7	2.6
2.1	1.9	1.8	1.9	2.0	2.1	2.2	2.6	3.0	2.3	2.1	2.2	2.1	1.8	1.8	2.1	2.2	2.3	2.3	2.4	2.3	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.6	2.6	2.3	2.2	2.4	2.3	2.3
2.0	1.9	1.4	1.6	1.5	1.8	2.1	3.1	3.0	2.7	2.4	2.2	2.2	1.6	1.5	1.7	1.9	1.9	1.9	2.2	1.9	2.0	2.0	2.2	2.4	2.5	2.7	2.1	1.8	2.7	2.4	[illegible]	2.7	2.7	2.5	2.3
2.2	2.6	1.5	1.5	1.4	1.7	1.9	3.9	1.9	2.6	2.2	1.6	1.5	1.3	1.4	1.3	1.5	1.6	1.7	1.9	1.7	1.8	1.9	2.1	2.5	3.4	5.0	3.5	2.5	2.5	3.0	2.6	3.5	2.3	2.1	2.1
2.7	2.5	2.3	2.9	2.5	2.4	2.7	3.2	3.8	3.1	2.5	1.8	1.7	1.4	1.5	1.8	3.3	3.5	3.8	3.1	3.3	3.3	2.4	1.9	2.0	2.7	3.9	3.5	3.5	4.4	5.9	5.2	3.8	3.6	3.3	3.2
3.5	2.9	2.6	3.0	3.2	3.0	2.6	3.2	3.3	3.6	4.3	3.5	3.2	2.2	2.8	2.4	2.5	2.5	3.3	4.2	5.2	3.1	1.8	2.7	3.8	3.0	2.8	3.6	3.6	3.2	2.9	3.8	4.4	3.4	3.6	3.0
1.8	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	2.6	2.8	2.9	2.5	2.2	1.6	1.4	1.3	1.6	2.3	3.2	1.6	1.5	2.2	4.0	3.1	3.4	3.7	2.6	2.1	1.9	2.8	3.4	4.0	3.1	2.5
1.9	1.7	1.5	1.8	1.4	1.3	1.4	1.4	1.4	1.3	1.3	2.1	1.8	1.7	1.4	1.2	1.4	1.4	1.5	1.4	1.4	1.2	1.3	1.3	1.6	1.6	1.9	2.4	1.4	1.4	1.3	1.3	1.3	1.6	2.3	2.3
1.9	2.2	1.8	2.3	2.4	2.4	2.1	1.4	1.1	1.1	1.2	1.4	1.9	2.0	2.1	1.4	1.3	1.2	1.3	1.0	1.1	1.0	1.3	1.2	1.1	1.2	1.2	1.3	1.1	1.2	1.2	1.0	1.0	1.1	1.0	1.3
1.1	1.5	1.7	1.9	2.1	2.7	3.3	3.0	2.1	1.7	1.5	1.8	1.9	2.1	2.8	2.8	2.1	1.5	1.4	1.4	1.3	1.4	1.3	1.1	.8	1.0	1.0	1.0	.9	.9	1.1	1.0	1.0	1.0	1.3	1.3
.9	1.2	1.2	1.4	1.5	2.0	2.8	3.6	3.7	3.0	2.8	2.6	2.3	2.5	3.4	3.8	4.0	3.3	3.1	2.7	2.7	2.7	2.5	2.2	2.1	1.9	1.7	1.7	1.4	1.4	1.8	1.4	1.1	1.2	1.4	1.0
2.3	2.4	2.8	3.0	3.5	3.9	4.5	4.6	4.8	4.7	4.3	4.5	4.3	4.4	4.8	5.5	5.7	5.7	5.4	5.1	5.0	4.7	5.0	4.8	4.4	4.3	3.8	3.6	3.0	2.7	2.8	2.8	2.4	2.5	2.3	2.2
4.9	5.1	5.3	5.3	5.6	5.9	6.4	6.6	6.7	6.6	6.5	[illegible]	7.6	7.6	7.7	7.6	7.6	7.1	6.8	6.8	6.8	6.9	7.1	7.0	6.5	6.4	6.5	6.4	6.1	5.9	5.6	5.5	5.2	4.9	4.9	4.8
6.6	6.6	6.8	6.9	7.4	7.7	7.9	8.2	8.8	9.1	8.9	9.0	9.1	9.0	8.7	8.4	8.0	7.9	8.1	8.4	8.5	8.5	8.7	8.3	8.2	8.4	8.8	9.3	9.2	8.8	8.5	7.2	6.5	6.6	6.1	6.4
8.1	8.1	8.3	8.5	8.9	9.3	9.3	9.3	9.2	9.0	9.4	9.5	9.5	9.6	9.2	9.1	8.9	8.7	8.9	9.2	9.3	9.6	9.7	9.7	9.3	9.8	9.3	9.7	8.5	8.9	8.6	7.7	8.5	8.3	8.4	8.2

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 34
JULY 2000 : AMSUA-5 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS


.3 .3 .3 .3 .3 .3 .3 .3 .4 .5 .5 .4 .0 -.3 -.3 .3 .3 .1 .1 .2 .2 .1 .1 .2 .2 .2 .3 .2 .3 .3 .3 .3 .3 .2 .3 .3
.4 .4 .3 .3 .4 .4 .3 [illegible] .3 [illegible] .4 .3 .6 -2.4 -2.8 -.1 .3 .4 .6 .5 .3 .5 .6 .4 .3 .3 .1 .2 -.1 .2 .3 .4 .2 .3 .4 .4
.4 .2 .4 .6 .5 .4 .2 .1 .0 [illegible] [illegible] .4 .4 -.4 .1 .4 [illegible] .6 .5 .2 .1 .1 .3 .4 .4 .3 .5 .6 .4 .1 .1 .4 .4 .4 .4 .3
.6 .3 .3 .5 .5 .6 .4 .3 .4 .4 .0 .1 .4 .6 .6 .6 .6 .2 .3 .1 .1 .1 .2 .3 .4 .4 .5 .3 -.2 -.1 .1 .4 .3 .4 .4 .5
.5 .5 .5 .5 .5 .6 .9 .3 .2 [illegible] -.1 [illegible] .3 .5 .6 .6 .6 .5 .4 .1 .0 .1 .5 .5 .7 .2 .0 .1 -.6 -.6 .2 .2 .2 .4 .5 .5
.5 .5 .6 .6 .6 .5 .8 .3 .0 .0 .0 .3 .4 .5 .6 .5 .5 .6 .7 .1 -.1 .4 .8 .9 1.0 .5 -.3 -.7 -.7 -.4 .1 [illegible] .3 .4 .5 .5
.3 .4 .5 .7 .7 .5 .4 .1 .1 -.2 .2 .3 .5 .6 .6 .6 .4 .9 1.2 -.2 -.2 .2 .9 .8 .8 .3 -.1 .0 -.1 -.1 .2 .3 .3 .4 .4 .4
.3 .4 .5 .6 .6 .5 .5 .3 .0 .0 .1 .2 .6 .6 .7 .5 .1 .3 .3 .0 .1 .3 .7 .5 .5 .3 .1 .0 -.2 .1 -.5 -.1 .2 .3 .3 .2
.2 .4 .5 .4 .4 .5 .5 .5 .4 .2 .0 .3 .3 .5 .4 .4 .4 .4 .2 .2 .1 .8 .7 .6 .4 .2 .2 -.1 -.1 -.1 -.1 .0 .0 .1 .1 .2
.5 .6 .6 .6 .6 .6 .7 .6 .5 .4 .2 .3 .3 .4 .4 .6 .6 .5 .5 .4 .4 .7 .5 .5 .3 .3 .1 .1 .0 .0 -.1 .2 -.1 .2 .2 .3
.4 .6 .5 .5 .6 .7 .7 .6 .6 .5 .5 .5 .4 .6 .5 .6 .7 .6 .5 .9 .7 .5 .3 .5 .6 .6 .6 .5 .5 .4 .4 .4 .3 .5 .2 .2
.4 .4 .5 .5 .5 .6 .6 .6 .6 .6 .4 .8 .3 .3 .6 .7 .7 .6 .6 .8 1.1 .4 .5 .5 .6 .7 .7 .6 .5 .3 .8 .8 .6 .5 .5 .5
.7 .6 .6 .7 .7 .6 .5 .5 .6 .6 .6 .7 .3 .5 .6 .6 .6 .3 .3 .4 .7 .7 .6 .6 .6 .6 .6 .7 .6 .4 .4 .4 .6 .5 .5 .4
.7 .8 .8 .8 .7 .7 .6 .5 .5 .6 .4 .5 .7 .7 .6 .6 .5 .4 .3 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .8 .6 .6 .5 .5
.6 .7 .6 .6 .6 .6 .6 .6 .6 .7 .6 .5 .6 .6 .5 .4 .4 .3 .1 .2 .5 .5 .5 .6 .6 .5 .5 .6 .7 .7 .7 .7 .7 .7 .7 .7
.2 .2 .3 .3 .3 .6 .6 .5 .6 .6 .6 .4 .2 .4 .5 .5 .6 .6 .6 .4 .3 .5 .2 .2 .4 .6 .4 .2 .2 .4 .3 .5 .4 .4 .4 .3
.3 .6 .5 .4 .3 .5 .6 .4 .7 1.0 .6 .2 -.2 .1 .2 .5 .4 -.1 -.9 -1.3 -1.4 -1.2 -1.0 -1.3 -1.0 -.8 -.1 .6 -.4 -.6 -.8 -1.0 -.6 -.5 .3 .2
-.4 -.4 .3 .2 .2 .3 .3 .8 1.2 .9 .2 -.4 -.4 -.5 -.5 -.4 -.5 -.5 -.8 -1.1 -1.8 -1.9 -1.4 -1.0 -.9 -.9 -1.5 -1.9 -2.1 -2.1 -2.2 -2.0 -1.6 -.4 -.4 -.6

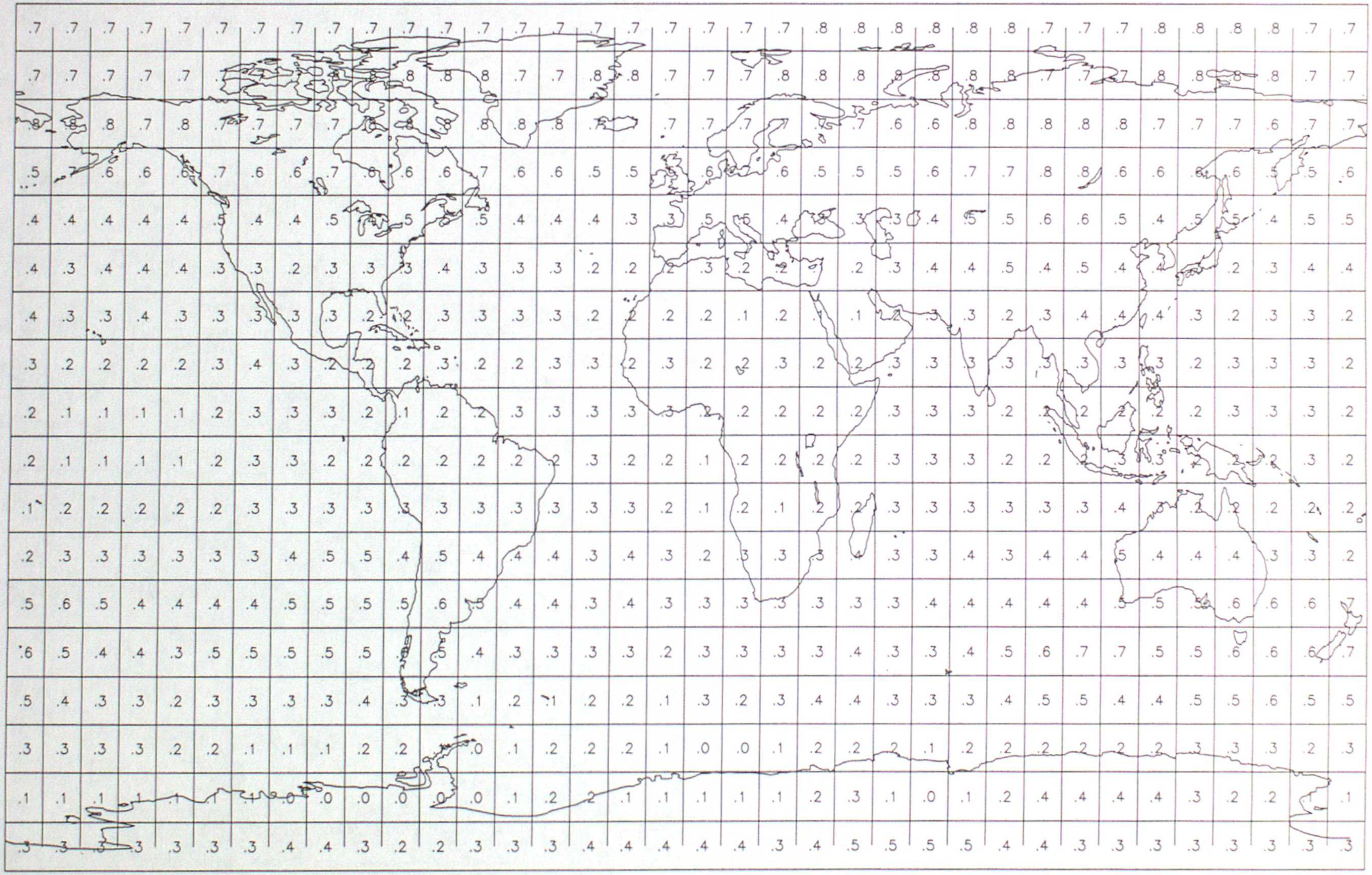
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JULY 2000 : AMSUA-5 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 35


.3 .3 .3 .3 .3 .3 .3 .3 .5 .6 .7 .6 .7 1.1 1.1 .8 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .4 .4 .4 .3 .4 .5 [illegible] [illegible] [illegible] .7 .8 1.3 1.5 1.6 1.3 .5 .5 .5 .6 .6 .5 .4 .6 .5 .6 .6 .7 .8 .7 .6 .5 .5 .4 .3 .3
.6 .7 .7 .9 .8 .7 .6 .7 .8 .8 .8 [illegible] .6 1.4 1.1 .6 .8 .5 .5 .7 .6 .7 .7 .6 .6 .5 .6 .7 .6 .7 .7 .8 .7 .6 .6 .7
.6 .7 .7 .5 .7 .6 .7 .7 .7 .6 .6 .6 .6 .5 .5 .5 .4 .6 .7 .7 .8 .6 .6 .6 .7 .8 .9 .9 .9 .8 .6 .5 .5 .5
.6 .5 .5 .4 .4 .7 .8 1.2 1.2 .9 .6 .7 .5 .5 .5 .5 .8 .8 .8 .8 1.0 1.1 .8 .8 1.1 1.4 1.7 1.3 1.2 1.0 .8 .7 .6 .6 .6
.6 .4 .4 .4 .4 .5 .8 1.1 .9 .8 .9 .7 .6 .4 .4 .4 .5 1.0 1.0 .8 .8 1.2 1.3 1.0 .8 1.8 2.8 2.8 1.6 1.0 .8 .6 .6 .6 .6
.6 .6 .5 .4 .4 .4 .7 1.3 .7 .8 1.0 .5 .4 .4 .3 .4 .8 1.5 1.5 1.6 1.0 1.2 1.0 1.1 .8 .6 1.2 1.0 .9 .9 .8 .5 .7 .5 .6 .5
.6 .6 .5 .6 .6 .6 .7 .8 1.0 .9 .8 .8 .4 .4 .4 .6 1.0 1.3 1.5 1.6 1.5 1.3 1.2 .6 .4 .7 .9 .8 .8 .8 1.2 1.0 .7 .7 .6 .9
.9 .8 .6 .7 .8 .8 .7 .8 .9 1.0 1.1 .8 .8 .6 .9 .8 .7 .7 .9 1.2 1.2 1.0 .7 .5 .7 .7 .7 .9 .9 1.0 .9 .9 .9 .8 .9 .9
.4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .9 .7 .6 .7 .9 .5 .4 .4 .4 .6 .9 1.2 .5 .5 .8 .8 .9 1.0 .9 .8 .9 .9 .9 1.1 .7 .5
.7 .5 .6 .7 .4 .4 .4 .4 .5 .5 1.5 1.6 .7 .6 .5 .4 .4 .5 .5 1.0 .8 .7 .7 .5 .5 .5 .5 .7 .4 .4 .8 .8 .7 .5 .9 .8
.9 .8 .6 .8 .7 .7 .6 .4 .5 .5 .7 1.8 .7 .8 .7 .5 .5 .5 .6 1.0 1.0 .6 .6 .5 .5 .5 .6 .5 .6 .8 .7 .6 .6 .7 .6 .6
.7 .7 .7 .7 .7 .7 .9 .7 .6 .6 .8 .8 .8 .7 .7 .6 .6 .8 .7 .7 .8 .6 .7 .6 .6 .5 .7 .7 .7 .7 .7 .7 .6 .6 .6 .7
.6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .8 .7 .6 .6 .6 .6 .6 .6 .7 .7 .7 .6 .6 .6 .7 .7 .7 .8 .7 .7 .7 .6 .7 .6 .7 .7
.7 .6 .6 .6 .6 .6 .6 .6 .6 .7 .8 .7 .6 .5 .6 .6 .6 .6 .8 .9 .7 .7 .6 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6
.8 .7 .6 .6 .6 .7 .7 .7 .7 .7 .7 [illegible] .7 .5 .5 .5 .6 .6 .7 .8 .8 .9 .9 1.1 .9 .8 .9 1.1 1.2 1.1 1.2 1.2 .9 .8 .7 .8
1.1 .8 1.0 1.0 1.3 1.5 1.5 1.3 1.5 1.5 1.2 1.3 .8 .8 .9 1.2 1.5 1.6 1.9 2.1 2.2 2.2 2.2 1.9 1.6 1.6 2.1 2.5 2.3 2.5 2.4 2.0 1.8 1.8 1.6 .9
1.0 1.0 1.1 1.1 1.0 1.1 1.3 1.7 1.7 1.2 .9 .9 1.1 1.2 1.2 1.3 1.3 1.5 1.5 1.7 1.7 1.9 2.3 2.5 2.6 2.7 2.6 2.3 2.3 2.0 1.9 1.8 1.7 2.0 1.5 1.0

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JULY 2000 : AMSUA-7 Channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 36



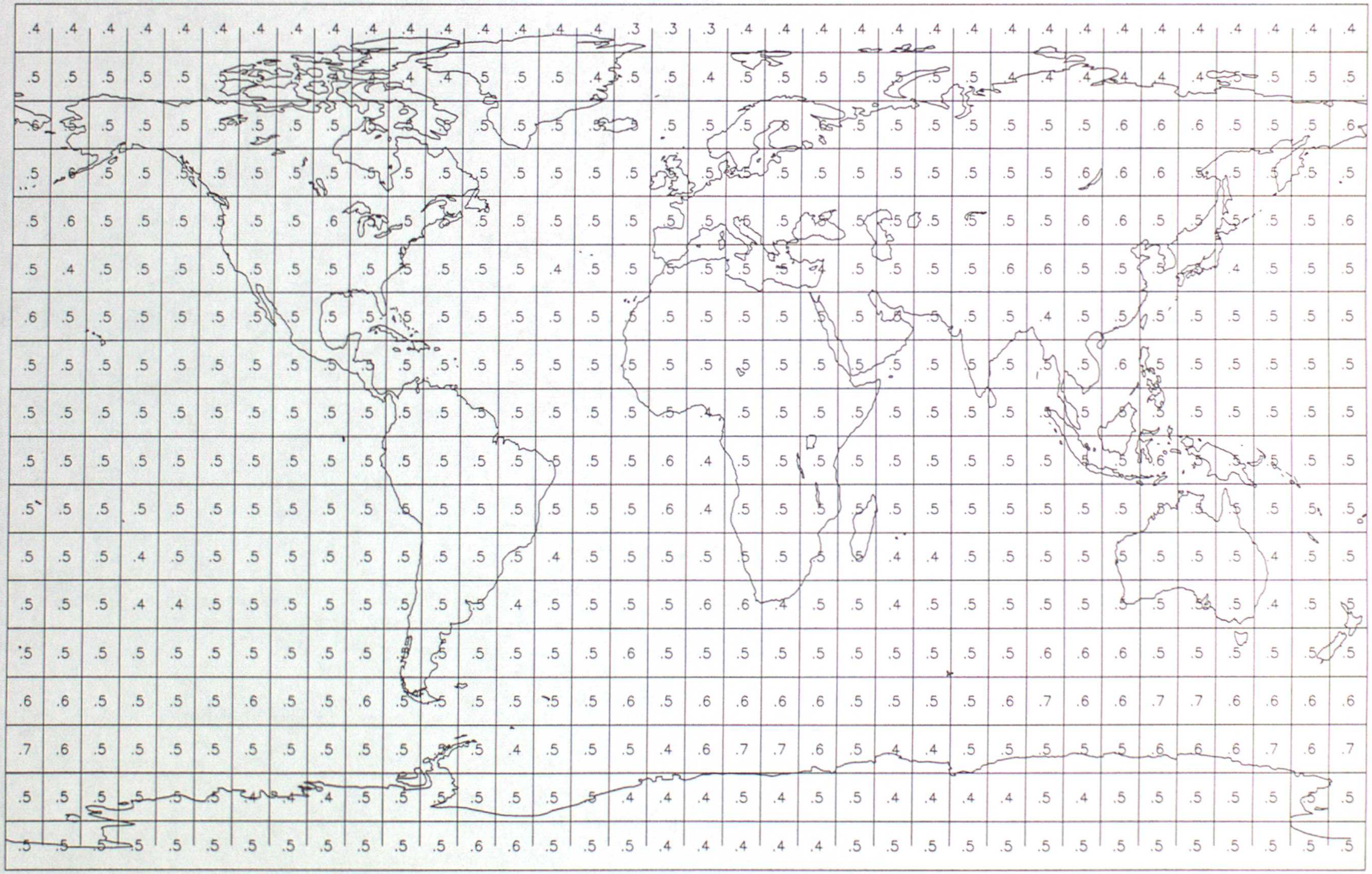
.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.7	.7	.7	.8	.8	.8	.8	.7	.7
.7	.7	.7	.7	.7	.7	.7	[illegible]	.8	.8	.8	.8	.8	.7	.7	.8	.8	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.8	.8	.8	.8	.7	.7
.8	.8	.8	.7	.8	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.7	[illegible]	.7	.7	.7	.7	.7	.7	.6	.6	.8	.8	.8	.8	.8	.7	.7	.7	.6	.7	.7
.5	.7	.6	.6	.6	.7	.6	.6	.7	.6	.6	.6	.7	.6	.6	.5	.5	.5	.6	.6	.6	.5	.5	.5	.6	.7	.7	.8	.8	.6	.6	.6	.6	.5	.5	.6
.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.5		.5	.4	.4	.4	.3	.3	.5	.5	.4	.3	.3	.3	.4	.5	.5	.6	.6	.5	.4	.5	.5	.4	.5	.5
.4	.3	.4	.4	.4	.3	.3	.2	.3	.3	.3	.4	.3	.3	.3	.2	.2	.2	.3	.2	.2	[illegible]	.2	.3	.4	.4	.5	.4	.5	.4	.4		.2	.3	.4	.4
.4	.3	.3	.4	.3	.3	.3	.3	.3	.2	.2	.3	.3	.3	.3	.2	.2	.2	.2	.1	.2	.1	.1	.2	.3	.3	.2	.3	.4	.4	.4	.3	.2	.3	.3	.2
.3	.2	.2	.2	.2	.3	.4	.3	.2	.2	.2	.3	.2	.2	.3	.3	.2	.3	.2	.2	.3	.2	.2	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2
.2	.1	.1	.1	.1	.2	.3	.3	.3	.2	.1	.2	.2	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.3	.3	.3	.2	.2	.2	.2	.2	.2	.3	.3	.3	.2
.2	.1	.1	.1	.1	.2	.3	.3	.2	.2	.2	.2	.2	.2	.2	.3	.2	.2	.1	.2	.2	.2	.2	.3	.3	.3	.2	.2	.2	.3	.3	.2	.2	.2	.3	.2
.1	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.1	.2	.1	.2	.2	.3	.3	.3	.3	.3	.3	.4	.3	.2	.2	.2	.2	.2
.2	.3	.3	.3	.3	.3	.3	.4	.5	.5	.4	.5	.4	.4	.4	.3	.4	.3	.2	.3	.3	.3	.4	.3	.3	.4	.3	.4	.4	.5	.4	.4	.4	.3	.3	.2
.5	.6	.5	.4	.4	.4	.4	.5	.5	.5	.5	.6	.5	.4	.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.7
.6	.5	.4	.4	.3	.5	.5	.5	.5	.5	.6	.5	.4	.3	.3	.3	.3	.2	.3	.3	.3	.3	.4	.3	.3	.4	.5	.6	.7	.7	.5	.5	.6	.6	.6	.7
.5	.4	.3	.3	.2	.3	.3	.3	.3	.4	.3	.3	.1	.2	.1	.2	.2	.1	.3	.2	.3	.4	.4	.3	.3	.3	.4	.5	.5	.4	.4	.5	.5	.6	.5	.5
.3	.3	.3	.3	.2	.2	.1	.1	.1	.2	.2	[illegible]	.0	.1	.2	.2	.2	.1	.0	.0	.1	.2	.2	.2	.1	.2	.2	.2	.2	.2	.2	.3	.3	.3	.2	.3
.1	.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0	.1	.2	.2	.1	.1	.1	.1	.1	.2	.3	.1	.0	.1	.2	.4	.4	.4	.4	.3	.2	.2	.1	.1
.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.2	.2	.3	.3	.3	.4	.4	.4	.4	.4	.3	.4	.5	.5	.5	.5	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

FIGURE 37

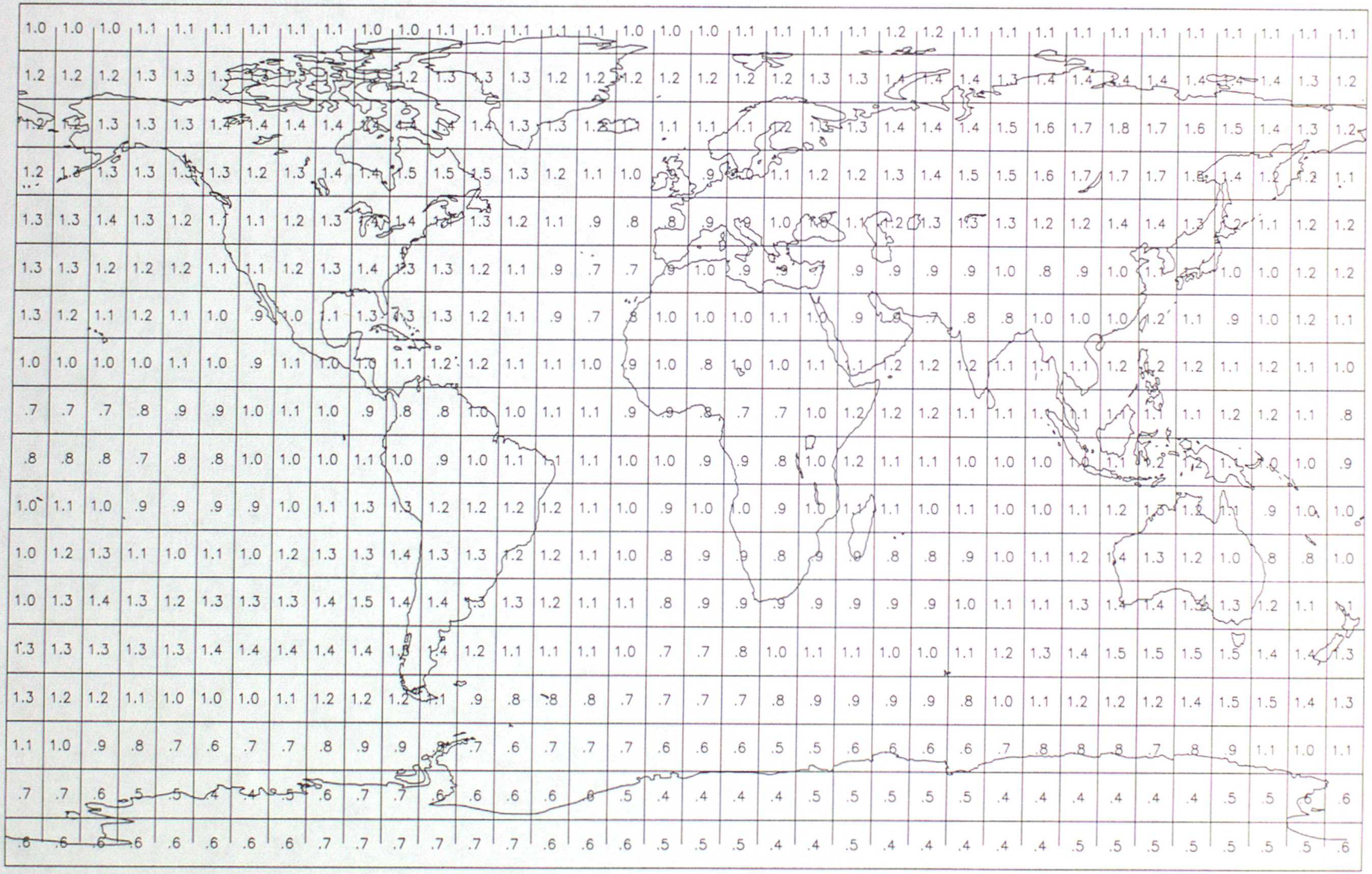
JULY 2000 : AMSUA-7 channel (300 hPa)

NOAA-15, USING ALL OBSERVATIONS



.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.4	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5
.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.6
.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5
.5	.6	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5	.5	.5	.6
.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.6	.6	.5	.5	.5		.4	.5	.5	.5
.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.6	.6	.4	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5
.6	.6	.5	.5	.5	.5	.6	.5	.5	.6	.5	.5	.5	.5	.5	.5	.6	.5	.6	.6	.6	.6	.5	.5	.5	.5	.6	.7	.6	.6	.7	.7	.6	.6	.6	.6
.7	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.4	.6	.7	.7	.6	.5	.4	.4	.5	.5	.5	.5	.5	.6	.6	.6	.7	.6	.7
.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.4	.5	.5	.4	.4	.4	.4	.5	.4	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 38
JULY 2000 : AMSUA-9 Channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS



1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	[illegible]	[illegible]	1.2	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2
1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.6	1.7	1.8	1.7	1.6	1.5	1.4	1.3	1.2
1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.3	1.2	1.1	1.0	.9	.9	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.7	1.8	1.4	1.2	1.2	1.1
1.3	1.3	1.4	1.3	1.2	1.1	1.1	1.2	1.3	1.4	1.4	1.4	1.3	1.2	1.1	.9	.8	.8	.9	.9	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.2	1.2	1.4	1.4	1.3	1.2	1.1	1.2	1.2
1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.2	1.3	1.4	1.3	1.3	1.2	1.1	.9	.7	.7	.9	1.0	.9	.9	.7	.9	.9	.9	.9	1.0	.8	.9	1.0	1.1	[illegible]	1.0	1.0	1.2	1.2
1.3	1.2	1.1	1.2	1.1	1.0	.9	1.0	1.1	1.3	1.3	1.3	1.2	1.1	.9	.7	.8	1.0	1.0	1.0	1.1	1.0	.9	.8	.7	.8	.8	1.0	1.0	1.0	1.2	1.1	.9	1.0	1.2	1.1
1.0	1.0	1.0	1.0	1.1	1.0	.9	1.1	1.0	1.0	1.1	1.2	1.2	1.1	1.1	1.0	.9	1.0	.8	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.2	1.1	1.0
.7	.7	.7	.8	.9	.9	1.0	1.1	1.0	.9	.8	.8	1.0	1.0	1.1	1.1	.9	.9	.8	.7	.7	1.0	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	.8
.8	.8	.8	.7	.8	.8	1.0	1.0	1.0	1.1	1.0	.9	1.0	1.1	1.1	1.1	1.0	1.0	.9	.9	.8	1.0	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.1	1.0	1.0	.9
1.0	1.1	1.0	.9	.9	.9	.9	1.0	1.1	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.0	.9	1.0	1.0	.9	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.1	1.2	1.3	1.2	1.1	.9	1.0	1.0
1.0	1.2	1.3	1.1	1.0	1.1	1.0	1.2	1.3	1.3	1.4	1.3	1.3	1.2	1.2	1.1	1.0	.8	.9	.9	.8	.9	.9	.8	.8	.9	1.0	1.1	1.2	1.4	1.3	1.2	1.0	.8	.8	1.0
1.0	1.3	1.4	1.3	1.2	1.3	1.3	1.3	1.4	1.5	1.4	1.4	1.3	1.3	1.2	1.1	1.1	.8	.9	.9	.9	.9	.9	.9	.9	1.0	1.1	1.1	1.3	1.4	1.4	1.3	1.3	1.2	1.1	1.1
1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.2	1.1	1.1	1.1	1.0	.7	.7	.8	1.0	1.1	1.1	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.3
1.3	1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.1	.9	.8	.8	.8	.7	.7	.7	.7	.8	.9	.9	.9	.9	.8	1.0	1.1	1.2	1.2	1.2	1.4	1.5	1.5	1.4	1.3
1.1	1.0	.9	.8	.7	.6	.7	.7	.8	.9	.9	.8	.7	.6	.7	.7	.7	.6	.6	.6	.5	.5	.6	.6	.6	.6	.7	.8	.8	.8	.7	.8	.9	1.1	1.0	1.1
.7	.7	.6	.5	.5	.4	.4	.5	.6	.7	.7	.6	.6	.6	.6	.6	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.6	.6
.6	.6	.6	.6	.6	.6	.6	.6	.7	.7	.7	.7	.7	.7	.6	.6	.6	.5	.5	.5	.4	.4	.5	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.6

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JULY 2000 : AMSUA-9 channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 39

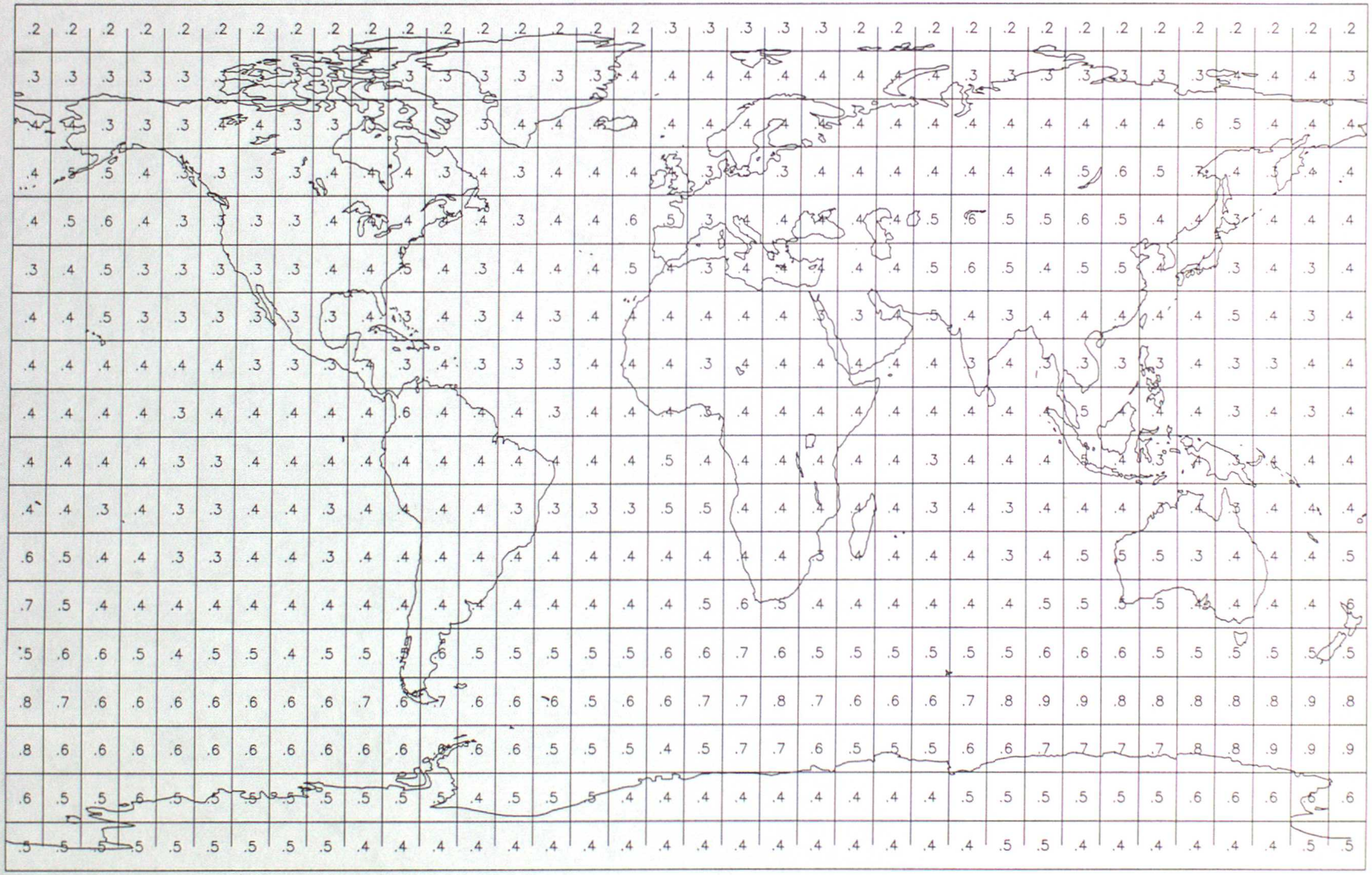

.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .3 [illegible] [illegible] [illegible] .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3
.4 .4 .3 .3 .3 .4 .4 .3 .3 [illegible] .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .4
.4 .5 .5 .4 .3 .3 .3 .3 .4 .4 .4 .3 .4 .3 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .5 .6 .5 .7 .4 .3 .4 .4
.4 .5 .6 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .6 .5 .3 .4 .4 .4 .4 .4 .5 .6 .5 .5 .6 .5 .4 .4 .3 .4 .4 .4
.3 .4 .5 .3 .3 .3 .3 .3 .4 .4 .5 .4 .3 .4 .4 .4 .5 .4 .3 .4 .4 .4 .4 .4 .5 .6 .5 .4 .5 .5 .4 [illegible] .3 .4 .3 .4
.4 .4 .5 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .4 .3 .4 .4 .4 .4 .4 .4 .3 .3 .4 .5 .4 .3 .4 .4 .4 .4 .4 .5 .4 .3 .4
.4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .3 .4 .3 .3 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .4
.4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .6 .4 .4 .4 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .3 .4 .3 .4
.4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .5 .4 .3 .4 .3 .4 .4 .4
.4 .4 .3 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .3 .3 .3 .3 .5 .5 .4 .4 .4 .4 .4 .3 .4 .3 .4 .4 .4 .3 .4 .3 .4 .4 .4
.6 .5 .4 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .5 .5 .5 .3 .4 .4 .4 .5
.7 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .6 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .6
.5 .6 .6 .5 .4 .5 .5 .4 .5 .5 .5 .6 .5 .5 .5 .5 .5 .6 .6 .7 .6 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5
.8 .7 .6 .6 .6 .6 .6 .6 .6 .7 .6 .7 .6 .6 .6 .5 .6 .6 .7 .7 .8 .7 .6 .6 .6 .7 .8 .9 .9 .8 .8 .8 .8 .8 .9 .8
.8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .4 .5 .7 .7 .6 .5 .5 .5 .6 .6 .7 .7 .7 .7 .8 .8 .9 .9 .9
.6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6
.5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
25548	38.8	-77.0	ALL	P	SUR	3	0	0	0.1	-0.6	0.6
275966	42.0	-23.3	ALL	P	SUR	1	0	0	0.0	-1.4	1.4
278003	42.0	-23.3	ALL	P	SUR	1	0	0	0.0	-1.4	1.4
41521	31.1	-67.0	ALL	P	SUR	293	0	0	0.6	0.3	0.6
41524	18.2	-72.1	ALL	P	SUR	183	0	0	0.7	1.4	1.6
41571	26.4	-52.5	ALL	P	SUR	495	0	0	0.4	0.4	0.6
41572	23.1	-44.9	ALL	P	SUR	514	0	0	0.5	0.2	0.5
41590	18.9	-47.1	ALL	P	SUR	501	0	0	0.5	0.5	0.7
41594	13.5	-51.7	ALL	P	SUR	518	0	0	0.5	0.6	0.8
41595	13.4	-56.7	ALL	P	SUR	524	0	0	0.5	0.7	0.8
41611	13.5	-44.1	ALL	P	SUR	483	0	0	0.6	0.5	0.8
41613	11.4	-36.8	ALL	P	SUR	470	0	0	0.6	0.4	0.7
41615	16.3	-42.1	ALL	P	SUR	461	0	0	0.5	0.3	0.6
41616	18.6	-42.9	ALL	P	SUR	507	0	0	0.5	0.2	0.6
41630	22.0	-50.2	ALL	P	SUR	333	0	0	0.4	0.5	0.6
41639	25.7	-80.2	ALL	P	SUR	27	0	0	0.6	1.4	1.6
41644	29.4	-36.8	ALL	P	SUR	338	0	0	0.5	0.0	0.5
41651	31.4	-67.9	ALL	P	SUR	57	0	0	0.8	4.2	4.3
44607	53.6	-28.8	ALL	P	SUR	546	0	0	0.8	-0.8	1.1
44608	30.2	-15.7	ALL	P	SUR	1362	0	0	0.6	0.5	0.8
44610	53.5	-33.2	ALL	P	SUR	1680	0	0	0.8	-0.1	0.8
44611	49.1	-26.8	ALL	P	SUR	568	1	0	0.8	0.2	0.8
44612	35.7	-35.6	ALL	P	SUR	560	1	0	0.6	0.2	0.6
44613	24.9	-48.9	ALL	P	SUR	673	0	0	0.4	0.3	0.5
44615	32.9	-44.2	ALL	P	SUR	530	0	0	0.4	0.1	0.5
44617	49.2	-28.4	ALL	P	SUR	562	0	0	0.8	0.0	0.8
44620	32.7	-44.3	ALL	P	SUR	539	0	0	0.5	0.1	0.5
44622	52.1	-40.0	ALL	P	SUR	585	0	0	0.7	-0.3	0.7
44623	45.3	-30.8	ALL	P	SUR	545	0	0	0.9	-0.2	0.9
44626	44.7	-14.2	ALL	P	SUR	1278	10	1	1.2	0.1	1.2
44627	40.1	-24.6	ALL	P	SUR	1209	3	0	0.9	0.1	0.9
44628	39.8	-36.0	ALL	P	SUR	1145	5	0	0.8	0.1	0.8
44630	53.2	-14.0	ALL	P	SUR	1655	11	1	0.7	0.3	0.7
44721	60.6	-24.1	ALL	P	SUR	722	1	0	0.5	0.0	0.5
44723	47.1	-29.5	ALL	P	SUR	540	0	0	0.8	-0.6	1.0
44724	42.6	-34.6	ALL	P	SUR	540	0	0	0.8	-0.4	0.9
44725	42.1	-49.8	ALL	P	SUR	330	0	0	0.6	-0.5	0.8
44726	28.4	-56.9	ALL	P	SUR	535	0	0	0.4	0.2	0.5
44727	33.0	-35.5	ALL	P	SUR	328	0	0	0.4	0.1	0.5
44729	50.9	-42.6	ALL	P	SUR	571	0	0	0.8	-0.3	0.8
44730	52.6	-35.2	ALL	P	SUR	609	0	0	0.7	0.1	0.7
44741	62.6	-33.2	ALL	P	SUR	586	1	0	0.9	0.5	1.0
44743	47.4	-31.4	ALL	P	SUR	808	0	0	0.7	0.2	0.7
44760	54.6	-33.7	ALL	P	SUR	1122	0	0	0.7	-0.5	0.9
44761	50.0	-45.2	ALL	P	SUR	591	0	0	0.7	-0.5	0.9
44765	31.7	-56.7	ALL	P	SUR	505	3	1	0.8	0.0	0.8
44771	56.0	-41.7	ALL	P	SUR	17	0	0	0.3	0.2	0.3
44773	47.3	-24.8	ALL	P	SUR	106	2	2	0.5	-0.6	0.8
44807	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	0.8	0.8
44861	40.1	-66.6	ALL	P	SUR	1	0	0	0.0	0.4	0.4
45803	45.4	-82.8	ALL	P	SUR	1	0	0	0.0	0.8	0.8
48536	38.8	-77.0	ALL	P	SUR	3	0	0	0.1	-0.8	0.8
62507	32.9	-26.8	ALL	P	SUR	1034	8	1	0.8	-0.1	0.8
62508	40.2	-14.5	ALL	P	SUR	688	0	0	1.2	-0.4	1.3
62509	44.8	-6.4	ALL	P	SUR	1055	0	0	0.7	-0.1	0.7
62512	42.6	-22.7	ALL	P	SUR	304	0	0	0.7	0.1	0.7
62513	45.2	-26.3	ALL	P	SUR	410	0	0	0.8	-0.9	1.2
62514	49.9	-19.5	ALL	P	SUR	658	0	0	0.7	-0.1	0.7
62515	48.0	-15.1	ALL	P	SUR	545	0	0	0.7	0.3	0.8
62516	45.5	-24.6	ALL	P	SUR	602	0	0	0.8	-0.1	0.8

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62520	34.0	-37.3	ALL	P	SUR	1031	3	0	0.5	-0.5	0.7
62596	61.4	-22.0	ALL	P	SUR	605	0	0	0.6	-0.2	0.6
62597	51.6	-7.3	ALL	P	SUR	1472	11	1	0.9	0.1	0.9
62608	53.5	-19.5	ALL	P	SUR	1	0	0	0.0	-2.3	2.3
62673	37.9	-12.1	ALL	P	SUR	249	0	0	0.6	-0.3	0.6
62674	39.4	-9.4	ALL	P	SUR	4	0	0	0.3	0.2	0.4
62675	35.5	-9.9	ALL	P	SUR	230	0	0	0.5	-0.3	0.6
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	0.0	0.0
62723	33.7	-10.4	ALL	P	SUR	218	0	0	0.6	-0.6	0.8
62725	29.1	-15.3	ALL	P	SUR	229	0	0	0.9	-0.2	1.0
62761	35.6	-9.9	ALL	P	SUR	249	0	0	0.6	0.0	0.6
62762	35.7	-10.8	ALL	P	SUR	175	0	0	0.6	0.6	0.9
62763	36.4	-10.3	ALL	P	SUR	242	0	0	0.5	-0.4	0.6
62881	51.0	-13.3	ALL	P	SUR	2	0	0	0.8	-0.3	0.9
64517	59.0	-23.8	ALL	P	SUR	1120	0	0	0.8	-0.2	0.8
64519	65.2	-23.9	ALL	P	SUR	590	0	0	0.7	-0.8	1.1
64520	65.4	-24.5	ALL	P	SUR	460	4	1	0.7	-0.6	0.9
64521	65.9	-24.5	ALL	P	SUR	266	4	2	1.2	-0.5	1.2
64546	49.3	-22.9	ALL	P	SUR	1201	6	0	1.3	0.9	1.5
64548	60.1	-19.2	ALL	P	SUR	546	0	0	0.7	-0.4	0.7
64698	59.2	-33.4	ALL	P	SUR	1027	1	0	0.9	-0.6	1.1
64699	59.6	-55.9	ALL	P	SUR	1100	0	0	0.6	-0.3	0.7
65593	60.6	-32.8	ALL	P	SUR	731	0	0	0.8	-0.3	0.9
65598	64.7	-54.5	ALL	P	SUR	1525	8	1	1.0	-0.5	1.1
65599	58.8	-37.6	ALL	P	SUR	1999	13	1	1.1	0.0	1.1
65600	56.0	-32.3	ALL	P	SUR	724	0	0	0.8	-0.6	1.0
65601	58.5	-38.4	ALL	P	SUR	1267	10	1	1.5	-0.4	1.6
65602	59.6	-38.4	ALL	P	SUR	1411	6	0	1.2	-0.1	1.2
WIND SPEED											
275966	42.0	-23.3	ALL	SPEED	SUR	1	0	0	0.0	3.1	3.1
278003	42.0	-23.3	ALL	SPEED	SUR	1	0	0	0.0	3.1	3.1
41521	31.1	-67.0	ALL	SPEED	SUR	257	0	0	1.6	-0.9	1.9
41571	26.4	-52.5	ALL	SPEED	SUR	472	0	0	3.4	0.6	3.5
41572	23.1	-44.9	ALL	SPEED	SUR	506	0	0	3.9	-2.4	4.6
41590	18.9	-47.1	ALL	SPEED	SUR	496	0	0	2.9	-0.7	3.0
41594	13.5	-51.7	ALL	SPEED	SUR	517	0	0	2.4	1.4	2.8
41611	13.5	-44.1	ALL	SPEED	SUR	476	0	0	1.3	-0.3	1.4
41613	11.4	-36.8	ALL	SPEED	SUR	465	0	0	1.8	0.3	1.9
41615	16.3	-42.1	ALL	SPEED	SUR	454	0	0	1.2	0.1	1.3
41616	18.6	-42.9	ALL	SPEED	SUR	507	0	0	1.6	0.4	1.6
41630	22.0	-50.2	ALL	SPEED	SUR	322	0	0	1.6	-2.7	3.1
41639	25.7	-80.2	ALL	SPEED	SUR	26	0	0	1.3	-2.2	2.6
41644	29.4	-36.8	ALL	SPEED	SUR	2	0	0	0.0	-2.4	2.4
41651	31.4	-67.9	ALL	SPEED	SUR	9	0	0	1.5	4.6	4.8
43528	14.5	-78.4	ALL	SPEED	SUR	326	0	0	1.4	7.9	8.0
44607	53.6	-28.8	ALL	SPEED	SUR	541	0	0	1.7	0.5	1.8
44724	42.6	-34.6	ALL	SPEED	SUR	300	0	0	7.0	9.5	11.8
44726	28.4	-56.9	ALL	SPEED	SUR	508	0	0	5.4	0.8	5.5
44743	47.4	-31.4	ALL	SPEED	SUR	13	0	0	1.3	1.3	1.8
44861	40.1	-66.6	ALL	SPEED	SUR	1	0	0	0.0	0.2	0.2
62506	36.0	-24.9	ALL	SPEED	SUR	570	0	0	1.3	-0.5	1.4
62508	40.2	-14.5	ALL	SPEED	SUR	661	0	0	1.2	0.4	1.3
62597	51.6	-7.3	ALL	SPEED	SUR	1344	0	0	1.7	-1.2	2.1
62608	53.5	-19.5	ALL	SPEED	SUR	1	0	0	0.0	-2.0	2.0
62881	51.0	-13.3	ALL	SPEED	SUR	2	0	0	0.8	0.6	1.0
65601	58.5	-38.4	ALL	SPEED	SUR	1	0	0	0.0	-6.1	6.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
275966	42.0	-23.3	ALL	DIRN.	SUR	1	0	0	0.0	-4.4	4.4
278003	42.0	-23.3	ALL	DIRN.	SUR	1	0	0	0.0	-4.4	4.4
41521	31.1	-67.0	ALL	DIRN.	SUR	155	0	0	12.9	-9.4	16.0
41571	26.4	-52.5	ALL	DIRN.	SUR	210	0	0	11.5	8.3	14.2
41572	23.1	-44.9	ALL	DIRN.	SUR	103	0	0	13.3	7.4	15.2
41590	18.9	-47.1	ALL	DIRN.	SUR	377	0	0	11.3	0.3	11.3
41594	13.5	-51.7	ALL	DIRN.	SUR	496	0	0	10.2	-6.0	11.9
41611	13.5	-44.1	ALL	DIRN.	SUR	459	0	0	13.0	15.6	20.3
41613	11.4	-36.8	ALL	DIRN.	SUR	351	0	0	11.3	-6.4	13.0
41615	16.3	-42.1	ALL	DIRN.	SUR	452	0	0	10.1	-2.2	10.3
41616	18.6	-42.9	ALL	DIRN.	SUR	491	0	0	12.4	2.9	12.7
41630	22.0	-50.2	ALL	DIRN.	SUR	61	0	0	30.1	5.7	30.7
41651	31.4	-67.9	ALL	DIRN.	SUR	3	0	0	2.3	-121.4	121.5
43528	14.5	-78.4	ALL	DIRN.	SUR	23	0	0	31.9	-10.6	33.6
44607	53.6	-28.8	ALL	DIRN.	SUR	413	0	0	16.8	-0.6	16.8
44724	42.6	-34.6	ALL	DIRN.	SUR	158	0	0	15.2	10.8	18.6
44726	28.4	-56.9	ALL	DIRN.	SUR	155	0	0	21.1	-10.4	23.6
62506	36.0	-24.9	ALL	DIRN.	SUR	296	0	0	20.0	0.4	20.0
62508	40.2	-14.5	ALL	DIRN.	SUR	408	0	0	13.8	-5.4	14.8
62597	51.6	-7.3	ALL	DIRN.	SUR	757	0	0	25.6	-2.2	25.7
62608	53.5	-19.5	ALL	DIRN.	SUR	1	0	0	0.0	-34.4	34.4
62881	51.0	-13.3	ALL	DIRN.	SUR	1	0	0	0.0	16.1	16.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

- :N REP. :Number of observations received excluding duplicates.
- :PG :Percentage of observations with gross errors.
- :PR :Percentage of observations rejected by quality control including rejections from the duplicate check.
- :PC :Percentage of observations with calm winds.
- :RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
- :BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3265	0	4	1.5	0.1	3240	0	4	0	6.9	0.6
ACA	1935	0	3	1.7	0.0	1943	0	3	0	6.3	0.7
AEA	284	0	5	1.7	0.2	289	0	8	0	8.4	1.3
AEL	257	0	12	1.6	-0.2	254	1	11	0	5.8	0.5
AEY	21	0	0	2.2	1.5	21	0	5	0	11.8	2.3
AFL	397	1	4	1.8	0.3	397	0	2	0	7.5	0.7
AFR	1137	1	7	1.6	0.0	1177	0	7	0	7.2	0.8
AFX	22	0	14	2.2	-0.3	22	5	23	0	11.1	3.2
AIH	127	0	3	1.5	-0.1	133	0	8	0	8.2	0.7
AJM	165	2	2	1.3	-0.3	164	0	1	0	5.8	0.9
AMM	70	0	6	1.5	0.4	76	0	7	0	6.5	0.0
AMT	34	0	12	2.6	0.5	34	0	15	0	9.9	1.6
AMX	189	2	5	1.9	0.3	190	0	4	0	9.9	0.7
ANZ	171	0	49	2.0	-1.2	173	1	50	0	5.5	0.7
AOM	410	0	3	1.6	0.7	421	0	4	0	7.5	1.1
AVA	185	1	2	1.7	0.4	192	1	3	0	8.8	0.3
AZA	542	0	3	2.0	0.5	556	0	5	0	8.9	0.7
BAF	24	0	0	1.2	-0.7	25	0	0	0	4.8	1.2
BAL	99	0	9	1.3	-0.5	99	0	11	0	6.1	1.0
BAW	1187	0	5	1.8	0.1	1182	0	6	0	6.8	0.9
BWA	51	0	4	1.9	1.4	55	0	7	0	10.1	1.4
CDN	593	0	2	1.7	0.2	592	0	2	0	6.6	0.6
CFC	23	0	4	2.0	0.3	21	0	14	0	11.7	3.6
CFG	429	0	2	1.5	-0.9	428	0	2	0	7.2	0.9
CLX	273	0	1	1.7	-0.3	274	0	1	0	6.8	0.6
CMM	525	0	2	1.7	0.2	520	0	2	0	5.1	0.8
COA	421	1	5	1.6	-0.2	423	0	7	0	10.3	1.7
CRL	412	1	2	1.6	0.8	415	0	2	0	6.1	0.7
CTB	96	1	4	1.6	-0.1	98	0	4	0	6.0	1.2
CUB	108	0	2	1.7	1.0	109	0	5	0	7.5	0.9
DAF	23	0	0	2.4	0.2	23	0	0	0	7.0	1.2
DAL	1804	0	15	1.5	-0.3	1835	0	16	0	7.9	0.8
DBY	336	1	2	1.4	-0.5	347	0	3	0	7.3	0.5
DCS	66	2	6	2.0	-0.1	67	0	4	0	8.0	-0.1
DLH	1461	0	5	1.6	-0.1	1465	0	6	0	6.6	0.7
EEZ	75	4	100	1.7	0.6	73	0	4	0	5.8	1.4
EIN	46	4	7	0.9	0.3	46	0	4	0	7.7	1.5
ELY	225	0	2	1.2	0.1	231	0	3	0	6.0	0.8
ETH	45	2	18	1.7	-0.4	44	0	18	0	13.1	-0.2
EWW	104	0	8	1.0	0.1	104	0	11	0	8.8	2.3
FDX	609	0	7	1.3	0.3	620	0	7	0	6.6	1.2
FIN	454	0	5	1.5	0.3	440	0	7	0	8.4	1.5
GAF	121	0	0	1.5	0.1	120	0	3	0	8.1	0.8
GCO	59	0	7	1.2	0.4	57	0	100	0	18.0	1.3
GRL	67	0	0	1.4	0.1	69	0	3	0	7.3	0.8
GTI	135	0	10	1.5	-0.4	132	0	12	0	8.7	0.0
HLF	52	2	13	1.7	-1.0	52	0	8	0	4.3	-0.1
IBE	1097	1	7	1.7	0.4	1087	0	10	0	8.6	0.7
ICE	1114	0	2	1.5	0.2	1106	1	4	0	7.7	1.1
IWD	44	0	2	1.2	-0.8	43	0	2	0	6.6	-0.3
JKK	220	0	5	1.0	0.0	208	0	9	0	9.1	0.5
JMC	129	1	12	1.7	1.1	126	0	17	0	10.0	1.4
KLM	1726	0	7	1.5	0.2	1762	0	8	0	6.8	0.8
LDA	64	0	5	1.6	-0.7	66	0	5	0	6.8	1.8
LDI	331	0	100	1.9	-0.9	333	0	5	0	7.3	0.3
LIB	124	0	2	1.5	0.9	128	0	4	0	8.9	0.6
LOT	309	0	3	1.7	-0.9	309	0	5	0	7.6	0.6
LTU	524	1	14	2.8	0.5	529	0	7	0	7.8	0.7
MAS	45	0	11	1.8	0.3	45	0	18	0	10.3	-2.0

IDENT.	TEMPERATURE					WIND					
	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
MON	68	0	0	1.7	0.1	68	0	4	0	9.5	1.0
MPD	120	1	5	1.9	0.4	120	1	5	0	6.1	0.1
MPH	631	0	2	1.7	-0.5	646	0	2	0	6.5	0.9
NAF	21	0	10	1.4	0.7	22	5	14	0	6.3	1.2
NCA	25	0	0	2.1	0.8	24	0	0	0	5.3	1.5
NWA	4146	0	2	1.6	0.4	4091	0	2	0	6.5	0.7
OAL	39	0	3	1.9	0.1	39	0	3	0	7.8	0.7
PAC	84	0	7	1.7	-0.3	84	1	10	0	9.2	2.2
RAM	85	0	4	1.8	-1.0	85	0	7	0	7.5	1.5
RCH	69	0	7	1.8	0.5	67	0	9	0	10.8	1.3
RJA	20	5	5	1.0	-0.5	21	0	0	0	5.2	1.0
ROY	268	0	4	1.6	-0.5	275	0	41	0	7.8	1.2
RRR	122	0	8	2.4	0.3	121	0	7	0	6.4	1.5
RZO	152	0	7	1.4	-0.5	151	0	9	0	9.1	0.4
SAS	1442	1	29	1.9	-0.1	1430	0	28	0	6.9	0.7
SIA	77	0	0	1.7	-0.9	76	0	1	0	5.7	-0.5
SLR	134	0	8	1.5	-0.9	134	0	12	0	9.1	0.2
SVA	118	1	3	1.4	-0.3	127	0	3	0	7.0	0.3
SWR	56	0	0	1.1	-0.1	57	0	5	0	8.5	1.1
TAP	360	1	4	1.2	-0.3	359	0	5	0	7.1	1.0
TCU	51	0	0	1.5	-1.1	50	0	0	0	5.2	0.8
THY	22	0	0	1.2	-0.8	23	0	0	0	4.5	1.2
TPA	24	0	8	1.2	0.3	24	0	13	0	12.6	-0.9
TSC	328	1	5	1.8	0.5	333	0	6	0	8.5	1.6
TWA	766	0	3	1.3	0.0	730	0	5	0	7.6	0.9
UAL	1952	0	100	1.8	-0.1	1974	0	100	0	5.9	0.6
UPS	584	0	9	1.4	0.4	599	0	10	0	7.1	0.7
USA	155	0	1	1.2	0.0	131	0	2	0	4.7	1.0
VIR	517	0	2	1.6	0.0	524	0	5	0	8.1	0.4
VKG	38	0	3	1.9	-0.5	39	0	3	0	8.2	0.0
WOA	136	0	7	1.9	0.7	139	0	9	0	8.8	1.3
YSS	25	0	0	1.3	0.5	25	0	4	0	8.8	1.2
EU	17342	0	17	1.3	-0.1	17342	0	17	0	4.7	0.6
KL	3848	0	15	1.3	0.7	3832	0	15	0	4.7	0.8
LH	438	0	14	1.6	1.1	438	0	14	0	4.6	1.0
N	456	1	3	2.4	0.7	476	0	4	0	7.4	1.0
US ACARS	18836	0	22	1.3	0.6	18829	0	18	0	4.9	0.5

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBLK	12	Z	100	9	0	6.2	24.8	24.0
ELML7	00	Z	100	19	0	13.2	32.1	29.3
ELML7	12	Z	100	18	0	13.7	23.6	19.2
FNOR	00	Z	100	12	0	11.5	40.7	39.1
FNOR	12	Z	100	11	0	11.2	28.3	26.0
FNOU	00	Z	100	13	0	5.9	30.2	29.6
FNOU	12	Z	100	13	0	8.8	27.2	25.7
FNPH	00	Z	100	7	0	25.8	30.7	16.6
FNPH	12	Z	100	11	0	25.1	48.5	41.5
FNRS	00	Z	100	11	0	8.9	23.6	21.8
FNRS	12	Z	100	10	0	10.6	14.1	9.3
LDWR	00	Z	100	28	0	10.0	13.9	9.6
LDWR	12	Z	100	26	0	17.7	19.0	6.8
OVYA2	00	Z	100	14	0	21.1	24.3	12.1
OVYA2	12	Z	100	11	0	18.2	21.2	11.0
OXYH2	00	Z	100	15	0	12.5	13.0	3.7
OXYH2	12	Z	100	15	0	12.3	12.3	0.3
S6LA	00	Z	100	3	0	7.3	38.7	38.0
S6LA	12	Z	100	4	0	17.1	25.2	18.5
ZCBP6	00	Z	100	8	0	26.7	26.7	0.1
ZCBP6	12	Z	100	9	0	25.7	26.2	5.3
03953	00	Z	100	27	0	15.8	34.8	31.0
03953	12	Z	100	27	0	13.2	19.3	14.1
04018	00	Z	100	28	0	10.4	20.1	17.2
04018	12	Z	100	28	0	12.4	16.0	10.1
04220	00	Z	100	27	0	9.4	27.2	25.6
04220	12	Z	100	26	0	10.9	21.4	18.5
04270	00	Z	100	26	0	10.1	14.6	10.5
04270	12	Z	100	25	0	12.7	14.0	5.8
04339	00	Z	100	26	0	9.3	22.4	20.4
04339	12	Z	100	25	0	9.6	15.6	12.2
04360	00	Z	100	26	0	8.4	10.8	6.8
04360	12	Z	100	25	0	14.0	14.2	-2.6
08001	00	Z	100	28	0	21.3	21.3	1.6
08001	12	Z	100	27	0	27.8	29.0	-8.2
08508	00	Z	100	3	0	3.7	40.2	40.0
08508	12	Z	100	26	0	13.7	33.9	31.1
08522	12	Z	100	28	0	7.9	14.6	12.2
60020	00	Z	100	1	0	0.0	24.0	24.0
71600	00	Z	100	29	0	9.8	16.5	13.2
71600	12	Z	100	29	0	10.9	17.1	13.2
72201	00	Z	100	26	0	24.6	32.9	21.8
72201	12	Z	100	27	0	12.9	23.4	19.5
72402	00	Z	100	28	0	12.7	57.0	55.5
72402	12	Z	100	26	0	14.5	61.5	59.7
74494	00	Z	100	26	0	7.3	15.0	13.1
74494	12	Z	100	28	0	14.2	14.4	-2.0
78016	00	Z	100	27	0	14.0	43.2	40.9
78016	12	Z	100	28	0	15.4	37.5	34.2

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBLK	12	Z	500	9	0	15.4	23.7	18.0
ELML7	00	Z	500	19	0	6.9	10.2	7.5
ELML7	12	Z	500	18	0	8.5	11.1	7.1
FNOR	00	Z	500	12	0	7.6	12.9	10.4
FNOR	12	Z	500	12	0	6.6	11.2	9.1
FNOU	00	Z	500	13	0	7.9	10.7	7.2
FNOU	12	Z	500	13	0	6.4	9.7	7.3
FNPH	00	Z	500	8	0	6.7	8.8	5.8
FNPH	12	Z	500	11	0	21.0	25.2	13.9
FNRS	00	Z	500	11	0	5.7	6.1	2.2
FNRS	12	Z	500	12	0	6.4	6.5	1.2
LDWR	00	Z	500	28	0	7.0	8.1	4.1
LDWR	12	Z	500	26	0	6.0	6.1	-0.8
OVYA2	00	Z	500	16	0	11.9	14.9	8.9
OVYA2	12	Z	500	12	0	14.6	19.5	12.9
OXYH2	00	Z	500	15	0	14.9	16.0	-5.8
OXYH2	12	Z	500	15	0	12.5	12.7	2.0
S6LA	00	Z	500	3	0	12.3	18.1	13.3
S6LA	12	Z	500	4	0	16.3	20.4	12.3
ZCBP6	00	Z	500	8	0	11.6	11.9	-2.8
ZCBP6	12	Z	500	9	0	30.0	30.0	0.3
03953	00	Z	500	28	0	8.3	13.0	10.0
03953	12	Z	500	28	0	9.3	11.6	7.0
04018	00	Z	500	29	0	8.9	12.0	8.1
04018	12	Z	500	28	0	8.6	11.1	7.1
04220	00	Z	500	27	0	16.1	17.4	6.6
04220	12	Z	500	26	0	11.8	13.2	5.8
04270	00	Z	500	27	0	9.7	12.1	7.1
04270	12	Z	500	25	0	11.3	11.9	3.7
04339	00	Z	500	26	0	9.1	11.6	7.2
04339	12	Z	500	25	0	7.4	10.4	7.4
04360	00	Z	500	26	0	12.4	12.5	1.5
04360	12	Z	500	25	0	10.7	10.8	-1.0
08001	00	Z	500	28	0	11.7	12.0	-2.4
08001	12	Z	500	28	0	14.2	15.5	-6.1
08508	00	Z	500	3	0	5.7	6.0	2.0
08508	12	Z	500	27	0	9.3	9.8	3.0
08522	12	Z	500	28	0	6.1	6.6	2.5
60020	00	Z	500	28	0	7.9	14.0	11.6
60020	12	Z	500	29	0	8.3	11.5	8.0
71600	00	Z	500	29	0	8.2	8.2	1.1
71600	12	Z	500	29	0	8.3	9.2	3.9
72201	00	Z	500	27	0	7.4	7.8	2.4
72201	12	Z	500	27	0	4.9	5.0	-1.0
72402	00	Z	500	28	0	10.5	17.4	13.9
72402	12	Z	500	26	0	7.9	12.9	10.2
74494	00	Z	500	29	0	7.2	8.4	4.2
74494	12	Z	500	28	0	8.4	8.4	0.1
78016	00	Z	500	29	0	8.9	20.3	18.2
78016	12	Z	500	28	0	15.0	24.8	19.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBLK	12	V	100	8	0	0	1.8	0.3	-0.4
ELML7	00	V	100	19	0	0	5.2	-0.2	0.3
ELML7	12	V	100	18	0	0	5.5	-1.3	0.9
FNOR	00	V	100	13	0	0	5.1	1.5	0.7
FNOR	12	V	100	11	0	0	4.6	-0.3	1.2
FNOU	00	V	100	13	0	0	3.4	1.1	0.7
FNOU	12	V	100	11	0	0	3.8	1.2	-0.7
FNPH	00	V	100	7	0	0	4.7	-0.3	-0.7
FNPH	12	V	100	11	0	0	4.7	0.6	-2.6
FNRS	00	V	100	12	0	0	3.6	0.5	0.9
FNRS	12	V	100	11	0	0	5.6	-1.4	-0.8
LDWR	00	V	100	29	0	0	2.2	-0.7	0.8
LDWR	12	V	100	26	0	0	2.1	-0.4	0.8
OVYA2	00	V	100	13	0	0	2.9	-0.4	0.5
OVYA2	12	V	100	9	0	0	3.2	0.3	-0.6
OXYH2	00	V	100	14	0	0	3.4	-0.1	0.2
OXYH2	12	V	100	14	0	0	2.7	-0.4	-0.3
ZCBP6	00	V	100	8	0	0	2.9	0.7	-0.3
ZCBP6	12	V	100	6	0	0	2.3	-0.4	-0.2
03953	00	V	100	28	0	0	2.6	-0.9	0.9
03953	12	V	100	27	0	0	2.6	0.1	0.6
04018	00	V	100	29	0	0	2.4	0.2	-0.3
04018	12	V	100	27	0	0	2.3	0.0	-0.3
04220	00	V	100	27	0	0	3.0	0.2	-0.8
04220	12	V	100	25	0	0	2.4	0.0	-0.2
04270	00	V	100	27	0	0	3.8	0.4	0.1
04270	12	V	100	23	0	0	3.5	1.5	0.1
04339	00	V	100	27	0	0	4.1	0.6	-0.2
04339	12	V	100	25	0	0	4.4	-0.4	1.4
04360	00	V	100	26	0	0	3.1	-0.8	0.7
04360	12	V	100	25	0	0	2.4	0.4	0.5
08001	00	V	100	28	0	0	4.9	1.0	2.0
08001	12	V	100	27	0	0	4.1	1.2	0.5
08508	00	V	100	1	0	0	3.0	-0.5	3.0
08508	12	V	100	16	0	0	4.2	0.3	0.9
08522	12	V	100	27	0	0	4.5	1.2	-0.7
60020	00	V	100	2	0	0	3.7	2.4	2.0
71600	00	V	100	30	0	0	3.3	0.3	0.7
71600	12	V	100	29	0	0	4.1	0.6	0.3
72201	00	V	100	26	0	0	3.5	1.8	0.2
72201	12	V	100	26	0	0	3.1	0.3	-0.8
72402	00	V	100	29	0	0	4.3	-0.2	1.2
72402	12	V	100	26	0	0	3.4	0.4	1.1
74494	00	V	100	27	0	0	3.0	0.5	1.1
74494	12	V	100	27	0	0	2.9	0.0	0.6
78016	00	V	100	28	0	0	4.7	0.3	0.0
78016	12	V	100	27	0	0	4.1	-0.8	0.9

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: JULY 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBLK	12	V	500	9	0	0	2.2	-0.3	0.5
ELML7	00	V	500	20	0	0	3.5	-0.4	0.2
ELML7	12	V	500	18	0	0	2.9	-0.7	-0.2
FNOR	00	V	500	14	0	0	4.5	0.7	0.3
FNOR	12	V	500	11	0	0	3.3	0.1	-0.9
FNOU	00	V	500	14	0	0	3.1	-0.1	-0.2
FNOU	12	V	500	13	0	0	3.8	-1.2	0.9
FNPH	00	V	500	8	0	0	4.8	-0.4	2.0
FNPH	12	V	500	11	0	0	5.1	-0.8	-0.1
FNRS	00	V	500	11	0	0	3.4	-0.2	0.4
FNRS	12	V	500	11	0	0	3.2	0.2	1.4
LDWR	00	V	500	29	0	0	2.3	0.1	0.1
LDWR	12	V	500	25	0	0	2.0	-0.5	0.4
OVYA2	00	V	500	16	0	0	3.4	-0.6	0.9
OVYA2	12	V	500	9	0	0	4.4	0.6	-0.8
OXYH2	00	V	500	16	0	0	3.0	-0.2	0.2
OXYH2	12	V	500	13	0	0	1.8	0.3	0.9
ZCBP6	00	V	500	8	0	0	4.3	1.5	-0.1
ZCBP6	12	V	500	6	0	0	3.6	-0.9	0.0
03953	00	V	500	29	0	0	3.9	-0.6	0.3
03953	12	V	500	27	0	0	3.0	-0.5	-0.5
04018	00	V	500	30	0	0	3.1	0.6	0.2
04018	12	V	500	28	0	0	3.6	1.6	-0.5
04220	00	V	500	27	0	0	4.8	0.7	0.5
04220	12	V	500	26	0	3	5.8	0.5	-0.1
04270	00	V	500	28	0	0	3.5	-1.2	0.0
04270	12	V	500	22	0	0	4.2	-0.3	-0.8
04339	00	V	500	27	0	0	3.8	0.8	0.5
04339	12	V	500	25	0	0	4.1	0.3	-0.1
04360	00	V	500	26	0	4	6.0	-0.9	-2.0
04360	12	V	500	25	0	0	4.2	-0.5	1.4
08001	00	V	500	28	0	0	4.2	0.5	0.2
08001	12	V	500	28	0	0	3.5	0.4	-0.1
08508	00	V	500	1	0	0	1.6	0.4	1.6
08508	12	V	500	15	0	0	3.0	0.6	-0.5
08522	12	V	500	28	0	0	3.8	-0.2	-0.9
60020	00	V	500	28	0	0	3.8	-0.3	-0.9
60020	12	V	500	28	0	0	4.4	0.4	-0.6
71600	00	V	500	30	0	0	3.8	0.5	0.6
71600	12	V	500	29	0	0	3.8	1.2	0.3
72201	00	V	500	27	0	0	2.5	0.6	-0.5
72201	12	V	500	26	0	0	2.4	-0.2	-0.3
72402	00	V	500	29	0	0	3.5	0.3	0.4
72402	12	V	500	26	0	0	3.4	-0.1	1.1
74494	00	V	500	30	0	0	3.6	-0.3	0.2
74494	12	V	500	28	0	0	3.9	0.1	1.6
78016	00	V	500	30	0	0	3.4	-0.5	1.4
78016	12	V	500	28	0	0	3.1	0.2	0.6

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45